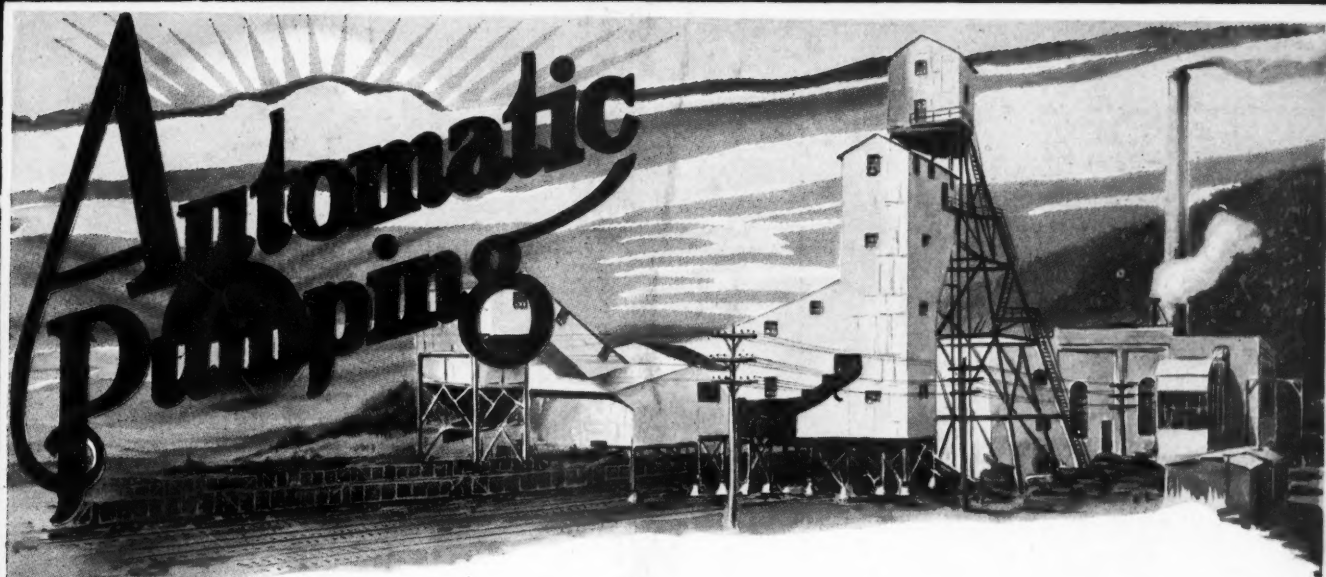


# COAL AGE



## The answer to lower cost of "mining" 271 billion gallons /

The industry "mines"  $2\frac{1}{2}$  times as many tons of water as of coal. To lower the cost of operating the 60,000 pumps required to take care of this water "tonnage" the industry is depending upon automatic pumping.

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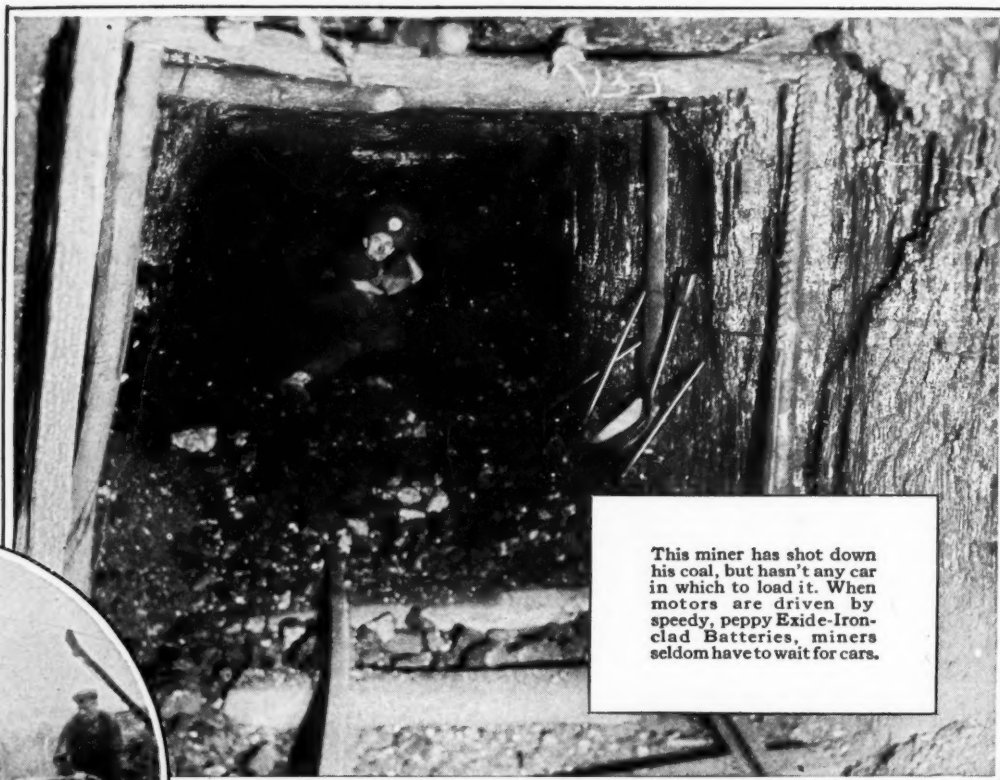
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MANUFACTURED IN THE HEART OF

A GREAT MINING REGION

The camera caught this trolley motor at the instant it was taking the rails after jumping the track. (Note the stick snapped in half by the weight of the wheel.) Battery motors often jump the track, too, and then the ruggedness of the battery is severely tested. If the battery is an Exide-Ironclad, however, you need not worry.



This miner has shot down his coal, but hasn't any car in which to load it. When motors are driven by speedy, peppy Exide-Ironclad Batteries, miners seldom have to wait for cars.



## More Speed and less cost in hauling coal



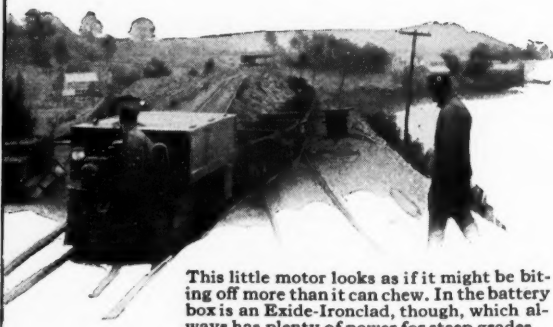
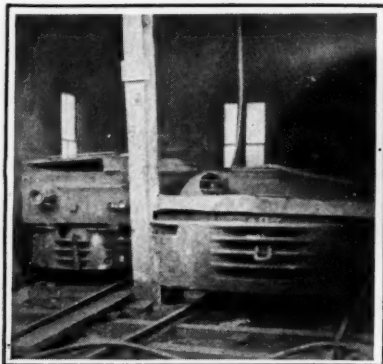
How many tons you put over the tipple each day depends largely upon the speed and efficiency of your haulage system. You can't mine coal faster than you can haul it. That's why more tons are mined daily when Exide-Ironclads drive the haulage motors.

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These motors have done their day's work and are on charge. They are taking current quickly, easily, and wasting very little of it, for the batteries are Exide-Ironclads, and this battery is extremely efficient on charge.

# Exide

## IRONCLAD BATTERIES



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# COAL AGE

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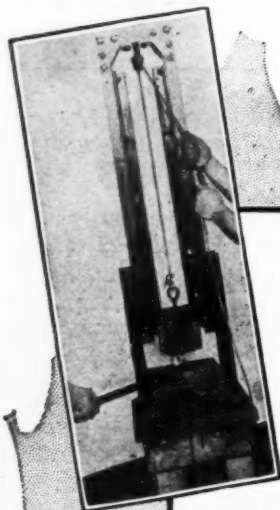
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## And Now— The "Jigger"

CONVEYORS COMMAND ATTENTION. They simply cannot be held in the coal industry's background. Conveyors, conveyors, everywhere, speeding, shuffling, shaking and jiggging. Next week "the original jiggging conveyor," the Eickhoff, as it operates at Toms Creek, Va., in Pennsylvania, and in Wyoming will be described by Frank H. Kneeland, associate editor. He is just back from Virginia with first-hand impressions of the performance the German machine is giving in the mines of the Virginia Iron, Coal & Coke Co.

Mr. Kneeland likes a good many things about this "jiggging," electrically driven, sectional, trough conveyor. It seems designed particularly for low coal such as that at Toms Creek but is giving a good account of itself in thicker beds. It fits into almost any method of mining and even can be equipped with a stout end section which can dig and load coal into itself in narrow work. It serves in ordinary room work and slabbing and also is readily applied to pillar drawing. When a room is driven up the full distance a break through is turned through the pillar either right or left. A cross feeder chute is installed in this break through and driven from the main conveyor. The pillar is then brought back by successive cuts.

In his article, the author suggests some ideas in mining methods which may prove helpful to those who are now using the Eickhoff machine or who will use it in the future. He suggests, also, an improvement in the driving mechanism, but his general conclusion is that the machine if properly applied, offers great cost-cutting possibilities in coal mining.



Weight Drop  
Machine for  
Testing Malleable Iron.



# A New Malleable FLECTO IRON

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HERE ARE TWO identical test pieces of Hot-dip Galvanized Malleable Cast Iron. Both were made from the same raw materials, in the same furnace, and under the same working conditions.

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Simply this.

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The other is just regular good hot-dip galvanized malleable iron. Frequently it is brittle.

Hot-dip Galvanizing of malleable iron has a tendency to cause it to become embrittled. Experience has shown that an average of 20%, or 1 out of every 5 ordinary malleable castings are brittle after galvanizing. Out of the same heat, after hot-dip galvanizing, part of the castings will be brittle—while the remainder will retain their malleable properties.

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# COAL AGE

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Devoted to the Operating, Technical and Business  
Problems of the Coal-Mining Industry

R. DAWSON HALL  
*Engineering Editor*

Volume 29

NEW YORK, FEBRUARY 18, 1926

Number 7

## Lewis Defeated

THE LARGEST coal strike on record in American industrial annals closed quietly and swiftly, and without the blare of publicity. Shorn of pretense and smoke-screenings, the victory was to the public and to the operators, and defeat to the dogged leader of the union forces. The union "vowing it would ne'er consent, consented" to arbitration, although the forbidden word was kept out of the simple document which recorded renewed co-operation. The check-off, also excluded by name from this document, was circuitously referred to in a paragraph which specifies that it and other inside arrangements between operators and union officials shall be the subject of "negotiation." The demands of the miners for fixed wages for five years—an impossible economic condition—were successfully resisted; and afterward they lessened the demand to a two-year fixed wage. The crumb which the union finally obtained was a fixed wage scale for less than a year and after that a wage subject to arbitration. What private understanding, if any, the opposing sides may have other than the signed agreement, is of course not certain; but it is certain that the operators backed by the public and by the President, have been able to resist arbitrary and ruinous demands which could only have led to economic and social disaster. This conclusion is accentuated by the loud peals of victory given off from the headquarters of the union leaders, while the operators maintain a demure and resigned attitude. If there was any private understanding concerning the terms of settlement, one is inclined to think it was that Mr. Lewis should be allowed to roar to his followers that he had achieved a great victory and be permitted to "get away with it." And there is no doubt that his misguided followers, impoverished and without advantage, will believe that they have won, and experience the joy and contentment that goes with it.

One point of Administration strategy glimmers out now which was not open to detection before. The Administration policy was, wisely, hands off, and resistance to the strategy of Lewis to get the government to intervene. And to cover the situation the President had written Congress asking it to give him the aid and administrative authority recommended in the report of the U. S. Coal Commission. This, then, was his reply, and that of his party, when Democratic politicians demanded the intervention of the President—that Congress should heed his earlier plea and give him the advantage of position asked for. Now that the strike is settled, it appears that those Republican heads of committees in Congress who had in charge the introduction of the special legislation asked for, will take action. "It was not proper," they say, "to embarrass the President by bringing this up during the strike." No cleverer piece of politics could be imagined; and it was sound sense withal.

The present crisis over, the anthracite industry will apply itself to the problem of regaining its lost markets, to problems of how to keep the price of coal down through keeping the cost down. And lower wages do not necessarily mean reduced costs. The American system, amply tested since the war, and only instanced by the methods of Henry Ford and others, is that in many cases high wages mean low costs. Mechanicalization, system, efficiency, cutting out of waste, reduce costs; but frequently low wages go along with high costs, for they are symbolic of a generally slack system of operation. In this general contention the union leaders have been correct. The coal operators beyond doubt have these big problems fully in mind.

## Make the Standby Automatic

ONLY SEVEN YEARS AGO the representatives of a large electrical manufacturer discouraged the officials of a certain coal company in their quest for a truly automatic substation and spoke disparagingly of its possibilities. At that time the manufacturer in question had sold several such stations for street railway work but considered the equipment too complicated for installation at the mines. Today automatic electrical control has become standard practice at mine plants and the equipment is believed to be more reliable and dependable than a substation attendant.

Following the same line of thought, why should not automatic starting equipment be provided for the internal combustion standby engines installed for fan drives? There are instances where two or three men are employed at remotely located fans chiefly for the purpose of starting the standby engine in case of failure of the electric power supply. The cost of such attendance usually ranges between \$3,000 and \$5,400 per year.

Engines that have found greatest favor in fan standby service are now equipped with electric starters. So far as automatically starting the engine itself is concerned, therefore, it would appear that the addition of a few relays would be all that would be necessary. In order to insure prompt starting of the power unit in cold weather, however, an electric fumer or vaporizer might advisably be installed. If the engine is direct connected to the fan it drives, the interposition of a magnetic clutch would facilitate connection of the two machines after the prime mover had been brought up to speed.

As to the reverse operation, stopping the engine and reconnecting the fan to its driving motor upon return of line power, this also could be accomplished automatically but probably this would not be necessary. Instead it might be found advisable to dispatch a mechanic to the fan whenever a suitable signal indicated that the standby unit had been called upon to start. This man could remain at the fan and stop the engine upon restoration of normal conditions.

Some expensively operated steam fans are now in use that would have been changed over to electric drive long ago had it not been considered necessary that an attendant be kept at the fan at all times to start the standby engine if line power were utilized. The extensive adoption of automatic starting for gasoline engines employed as fan standbys would effect appreciable total savings in the coal fields as a whole.

### Coal Will Serve the Farmer

**T**HOSE WHO FEAR a decline in the gross consumption of coal in this country, because greater and greater boiler and furnace efficiencies are being obtained in the burning of this fuel in the larger steam plants, forget that a limit to the exercising of efficiencies exists and that the gaining of higher efficiencies becomes increasingly difficult. The growth of power consumption is so rapid that fuel saved by improved practices in central stations—and more besides—will be required.

The future power demands of the farmer will contribute to a healthy growth of the coal industry. The agriculturist will establish greater stability in coal as his requirements will be regular; for he is active even when those engaged in other industries are idle. People must eat whatever else they may refrain from doing.

The coal industry should take heart in what was said relating to the future of the farmer, at the annual banquet of the Engineers' Society of Western Pennsylvania, in Pittsburgh on Jan. 25. Gen. Guy Tripp, chairman of the board of directors of the Westinghouse Electric & Manufacturing Co., pointed to the need for a wide application of power to jobs on the farm and conceded to the farmer prosperity by this means.

Later, as a side issue in his address, George E. Roberts, financier and economist of New York City, dealt with the economic side of farming. About one-third of the population of the United States lives on farms. Products from the soil are generally in excess of domestic consumption. This fact is viewed with alarm by many economists who point to it as one of the reasons for the financial embarrassment of the farmer in the past. But Mr. Roberts believes otherwise; he thinks there is no immediate danger of our farmers exceeding an economical limit of production. The surplus of products will be taken gladly in foreign markets. His views coupled with those of Mr. Tripp depict clearly a situation of the future which will affect the coal industry for the better.

The needs of the American farmer will necessitate a gigantic power program in which transmission lines will be extended in every direction to the farms. Being a more or less heavy industry farming will consume much electrical power. The coal industry will expand thereby in about the same degree as the interests which produce power.

### Lighter Wheels, Heavier Loads

**I**N THESE DAYS of low prices and fierce competition no stone is being left unturned to decrease coal costs. One means of furthering this end that is now receiving serious attention in some quarters is the substitution of steel for iron wheels on the mine rolling stock. Several advantages are realized from this change.

Heretofore the chilled-tread, cast-iron wheel has been used almost exclusively on American mine cars. England and Canada, on the other hand, have long been

users of the steel wheel. It seems really strange, therefore, that the United States has been so backward in its adoption.

Steel casting is far tougher and more ductile than cast iron. It is however, more difficult to produce. A steel casting is much more liable to be rough, contain blow holes, cold shuts and the like than iron which melts and pours at a far lower temperature. Consequently a good steel casting is harder to manufacture and correspondingly more expensive than is an iron casting of comparable quality.

At the present time several coal companies are trying out steel wheels on their mine cars. Such wheels are much lighter than those made of cast iron and will withstand spragging better, although the practice of using sprags is fast going to the discard. In wrecks or derailments also steel wheels are less vulnerable. Under heavy shock or impact they will bend or distort whereas an iron wheel will break.

It is probably the lessened weight, however, that appeals most strongly to the coal-mining man. A certain company in Kentucky that employs nearly 2,000 mine cars has reduced the weight of the individual wheels from 174 to 100 lb. (both limits being approximate) through the substitution of steel for iron. This is a decrease of roughly 43 per cent in the weight of the wheel itself and means that a steel-wheeled car weighs about 300 lb. less than one fitted with iron wheels.

Assuming that the new wheels will rotate as easily as the older ones any decrease in their weight signifies that a locomotive with a given tractive effort will be able to haul as much more coal as the trip is decreased in weight. In the Kentucky instance the decrease in total car weight resulting from the substitution of steel wheels for iron is about 7 per cent. Thus a locomotive capable of hauling a trip of 14 cars fitted with iron wheels could haul 15 cars equipped with the lighter steel wheels, the weights, capacities and loadings of the car bodies remaining the same.

### Mechanical Sparks

**A**WORKMAN recently repairing a leaky gas main in New York City tried to cut the pipe with a chisel. The resultant spark set fire to the gas causing a violent explosion. The danger of mechanical sparks igniting methane when an atmosphere with an explosive mixture of the gas exists in the mine should not be overlooked. The only safe corrective is to create a ventilating current that will remove the gas, perhaps not from the immediate point where the spark is struck but in the air around it.

It may be impossible to ventilate an under or other cut in the coal—any application of a fan specially to perform that service might add to the hazard and would raise the fine dust—but the working place should always be so ventilated that the gas if ignited will not find in the air of the room sufficient fuel to propagate the flame.

The disaster at the Horning mine, some say, was due to a mechanical spark igniting gas and to the gas igniting coal. In isolating the fire an explosion occurred. The operating company had made every effort to keep the mine safe. Nevertheless, it may be said that if the ignition was from a mechanical spark, had the cutters been sprinkled the gas might not have ignited, and had a box of rock dust been available the fire might have been extinguished.



# Flexible System of Belt Conveyors Is Applied To Thin-Seam Room-and-Pillar Mining

Pennsylvania Coal & Coke Corp. Builds and Uses Two Types—20-Ft., 470-Lb. Self-Contained Units at Face Deliver to Main Belt on Rollers Between Posts

By J. H. Edwards  
Associate Editor

**E**XPERIENCE during the past eighteen months in the mines of the Pennsylvania Coal & Coke Corporation with belt conveyors in room-and-pillar mining has proved the practicability of this system. This company, which operates thirty-two mines in central Pennsylvania, was one of the first to develop in a practical way the use of self-contained short-length belt conveyors. The company was also a pioneer in the use of jack-supported main conveyors for rooms.

Belt conveyors are now operating in three of the mines. During the past year 33,100 tons were loaded over belts. Additional conveyors are now being built in the company shop to increase the tonnage mined by this method.

After considerable experimentation the company is using a 20-ft., self-contained belt conveyor unit parallel to each 30-ft. face, arranged so that it discharges onto a belt conveyor of another type laid along the rib to a car loading point at the room neck. Two wide rooms may be worked simultaneously by the short transverse conveyors serving one main

conveyor. As the face advances the main conveyor is lengthened by the use of a number of the 20-ft. units working in tandem until the distance is great enough to permit a 50-ft. extension of the main belt.

The main conveyor consists of a head or drive section, one or more 100-ft. lengths of 22-in. composition belt, a number of sets of wooden idlers and light-weight roof jacks. Fig. 2 shows one of these main conveyors in use in the Moss Creek mine of the company, where a good deal of the experimenting was done. The head section, which is the one mounted at the entry, has two drive pulleys and an idler. As shown in Fig. 3, the motor is belted to the head pulley A, the shaft of which is connected by a chain to the other driving pulley, B.

In the space between the head and tail sections the idlers supporting the belt are wooden rollers, mounted 6 ft. apart. The upper or troughing idler consists of three pieces, one cylindrical and two cone-shaped. The bottom idler is cylindrical and made in one piece. The bottom roller is omitted from alternate idler sets. This

means that the lower strand of the belt is supported at 12-ft. intervals.

The rollers and bearings are of simple construction. The wood is bored somewhat larger than the shaft and molten babbitt poured around in a mandrel to form a bearing. Lubricant is applied to the rollers only when the conveyor is moved to a new room. At that time the hole in the roller is stuffed with grease and the shaft is pushed through it.

The main conveyor is extended in 50-ft. lengths—that is, by splicing in 100-ft. sections of belting as the room progresses. To make the extension it is necessary only to open a splice in the belt, move the tail section 50-ft. ahead, set up seven idler sets, and splice in the extra 100-ft. piece of belting.

Temporary extensions to the main conveyor are formed by using one, two, or three of the 20-ft. self-contained conveyors which are interchangeable with that used across the face in a 28- to 30-ft. room. As an extension to the main conveyor, these short conveyors are lapped, one over the other, as shown in

## IS THIS A PROPHECY FULFILLED?

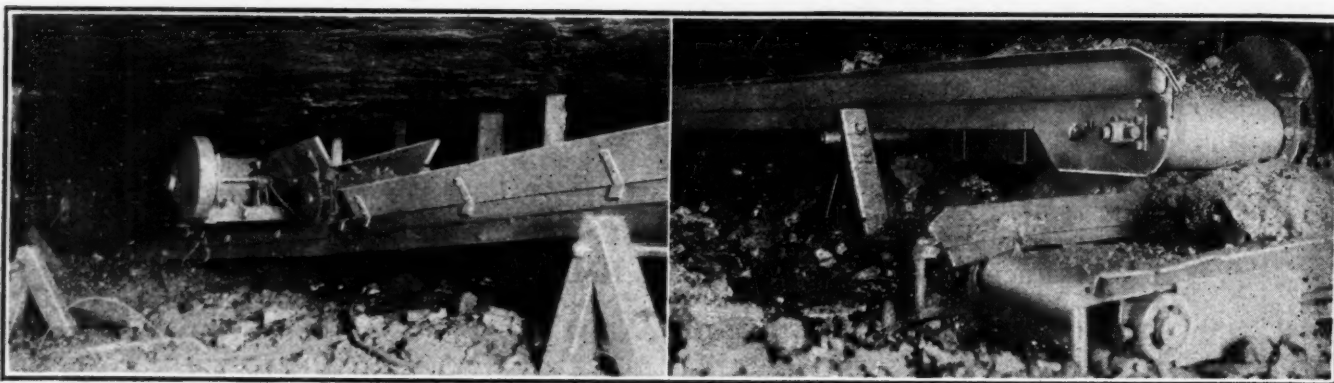
**W**HEN the modern surge toward mechanical loading underground got well on its way a few years ago a good many sound mining men declared the industry would shift from one fanciful scheme to another but eventually would come back to old-fashioned room-and-pillar methods of mining no matter what sort of machines they used. These men held that it was wrong to make the system of mining conform to the machine. The machine, they thought, ought to conform to the system of mining. This is exactly what the Pennsylvania Coal & Coke Corporation has done. It has made use of the flexibility of the belt and applied it as fully as possible to old-style mining layout. The performance of the belt units thus far has been good. The future must speak for itself.

Fig. 1. The extension can be varied by changing the length of lap. The 5-in. wooden side boards of the short conveyor are removable in sections in order to provide for this lapping.

In Fig. 1 is shown one of the 20-ft. lateral or face conveyors emptying into a similar conveyor which is serving as an extension to the main. The head end of the face conveyor is elevated by being set on a "horse" made with wooden legs and a pipe cross member.

Construction of the 20-ft. conveyors can best be explained by referring to the shop views, Figs. 4 and 6. The light weight of this device is such as would seem to qualify the mechanics of the company to design and build airplanes. The unit, complete with the 16-in. belt but without the 1-hp. motor, weighs only 470 lb.

The main frame of the unit is made up of two 3-in. light-weight channels, an 18-ft. sheet 16 in. wide by  $\frac{1}{2}$  in. thick and two 2-in., wood-filled steel angles 20 ft. long. No idlers are provided. The upper strand of the belt slides on the steel sheet, and the bottom strand is supported every 3 ft. by a cross-piece of  $\frac{1}{2}$ -in. pipe.



**Fig. 1—Overlapping Conveyors Extending Back to the Face Discharge Coal Into Main Belt**

The view at the left looking toward the face, shows three 20-ft. unit-conveyors acting in tandem as an extension. These units are used until the face advances far enough to allow a 50-ft. extension on the longer conveyor. The center unit is lapped several

feet over the one in front of it, which has a section of the side boards removed to permit this arrangement. The picture at the right in this pair shows the unit conveyor discharging into the main. The room is 30 ft. wide. The use of a 20-ft. lateral

conveyor at the face leaves space for stabling the mining machine at one end. After the cut is made the conveyor is advanced to within 2 ft. of the face. Some of the coal falls on the belt when the shot is fired.

The  $\frac{1}{2}$ -in. sheet is kept from sagging through the center by a number of  $\frac{3}{4}$ -in. cross angles set 18 in. apart.

In the construction, electric welding takes the place of all riveting. The crowned, squirrel-cage drive pulley, of 6 $\frac{1}{2}$ -in. diameter, is made up by welding twenty  $\frac{1}{2}$  x  $\frac{3}{4}$ -in. strips to five disks which in turn are welded to the shaft. A screw adjustment of 6 in. for belt tightening is provided at the tail pulley.

#### TAIL PIECE AIDS MACHINE

An important detail of the construction is a tail piece which follows back the tail-pulley bearing filling the gap between the upper and lower strands of the belt and preventing the entrance of fine coal. The white mark near the head of the adjusting screw, Fig. 6, indicates the back end of this tail piece which slides against the web of the channel. Some of the first conveyors which were built without this device gave trouble. The belt stuck because fine coal worked its way between the strands.

The widening portion of the side frames at the drive pulley is formed by splitting the 3-in. channel, expanding it to 7 in. and welding in a filler web to support the bearing. To date, thirty of these 20-ft. conveyors have been built in the company shop at Gallatzin, Pa. All parts are made interchangeable by the use of jigs for forming and drilling. A roller chain is used for the single-reduction drive between the motor and head pulley.

The illustrations which show the conveyors at work were taken in Moss Creek mine, No. 21, at Marsteller, Pa. This mine is in the Lower Freeport seam which has an average thickness of about 40 in. in the section

where the conveyors are used. About 6 in. from the bottom of the coal there is a parting consisting of 1 to 2 in. of "mining slate." Above the coal is 2 to 4 in. of draw slate, and over that 8 to 12 in. of what is locally termed "cannelized slate."

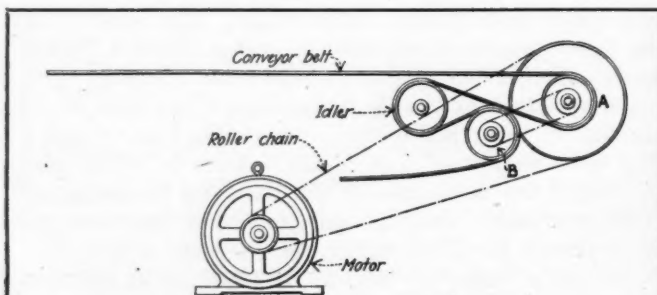
Fig. 5, taken from the mine map, indicates the methods employed in a series of eleven rooms, each 275 ft. long. The positions of the main and 20-ft. conveyors, as they were arranged when the photographs were made for the illustrations in this article, are indicated in full lines. The positions of the main conveyor while mining rooms Nos. 1 and 10 inclusive, are shown by the dotted lines.

Rooms 1 and 2 were driven double with the main conveyor in room 2. The coal from room No. 1 was moved through the crosscuts to the main conveyor by means of the 20-ft., self-contained conveyors. Drawing the pillars proved difficult. An unfavorable cave while drawing the third pillar influenced the management to try a different method on the next set up.

#### DIFFERENT METHODS TRIED

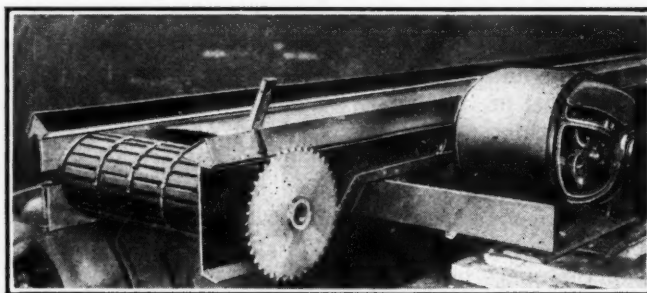
The three-room system was tried on rooms 3, 4 and 5, with the main conveyor in room 4, which was driven only 10 to 12 ft. wide. In this case the pillars were drawn with less trouble but at an unfavorable cost. In the next set up the three-room system was tried again, the main conveyor being installed in the narrow room, No. 7. Here was tried the idea of drawing pillars by starting with a diagonal crosscut. The principal objection to this was the use of too many conveyors.

Rooms 9 and 10 were driven double with 15-ft. pillars between, and no attempt made to recover the pillar



**Fig. 3—Drive Scheme at Head of Main Conveyor**

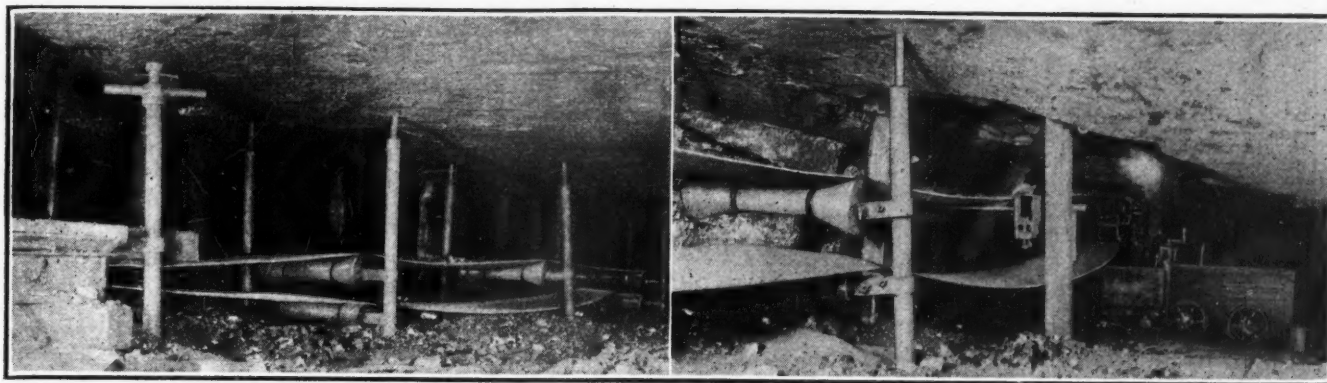
The motor is belted directly to a large pulley mounted on the same shaft as the conveyor-belt pulley, A. The other belt drive pulley, B, is connected to the first by a roller chain.



**Fig. 4—Drive End of 20-Ft. Conveyor**

Without the  $\frac{3}{4}$ -hp. motor but with the belt, the conveyor weighs only 470 lb. Electric welds take the place of all rivets in the construction. Instead of the belt rolling over idlers, as on the main conveyor, it slides on the sheet-steel bottom. The drive pulley which has a diameter of 6 $\frac{1}{2}$  in. at the crown is made light by squirrel-cage construction.





**Fig. 2—Belts Supported Thus Transport Coal from Face Conveyors to the Loading Point**

The tail end of the main conveyor is shown at the left of this pair of pictures. The conveyor is operating in a room 30 ft. wide. One end of the frame of section equipped with a take-up mechanism can be seen in the left side of the photograph. The belt,

which is 22 in. wide is in 100-ft. lengths. The head or discharge end of the main conveyor appears in the photograph at the right. The steel frame of this drive section is only 15 ft. long. The motor is belted to a pulley mounted on the shaft of the end driving-

roller. The idlers supporting the belt are of wood with babbitt centers. The upper or troughing idlers are in three sections each turning freely on the shaft. This plan of carrying coal out of rooms by belt has some advantages due to its flexibility.

coal. In this instance the main conveyor was set up in room 9. Of the various methods tried up to this time the latter proved the most attractive from the standpoints of safety and cost.

#### ONE ROOM DRIVEN SINGLE

No. 11 room, the one being worked when the photographs were made, is being driven single in order to obtain a cost comparison between that and the double-room method. In this place four men were employed at the face and one at the entry. From 12 to 18 in. of top is taken down at the loading point on the entry to provide head room for the main conveyor and its drive pulley. The main and the 20-ft. conveyors are all controlled by the entryman. The 30-ft. face is undercut to a depth of 6 ft. with a shortwall machine. After a cut is finished the machine is stabled at the end of the lateral conveyor on the opposite side of the room from the main conveyor.

The cycle of operations at the face is as follows: After the completion of a cut, the lateral conveyor is moved to within 2 ft. of the face, and posts set back of the conveyor on 3- to 4-ft. centers. The coal is then drilled by hand and is shot with permissible explosives set off by a magneto-type firing battery. Some of the coal falls upon the conveyor, which has the side board removed from the side next to the face to prevent damage to the board, and to decrease the shoveling height.

The four face men then start loading the half of the face on the side where the machine is stabled. After this section of the face is loaded, two of the men sump in with the machine and start the next cut. When they have cut as far as the coal is loaded, they leave the machine under the coal and help complete the loading. When the remainder of the face is being cut, the other two men start drilling. The main conveyor is extended by decreasing the lap of the 20-ft. conveyors, by adding another 20-ft. conveyor, or by adding 100 ft. of belt, as the status of the work may dictate.

#### RESULTS OF TIME STUDY

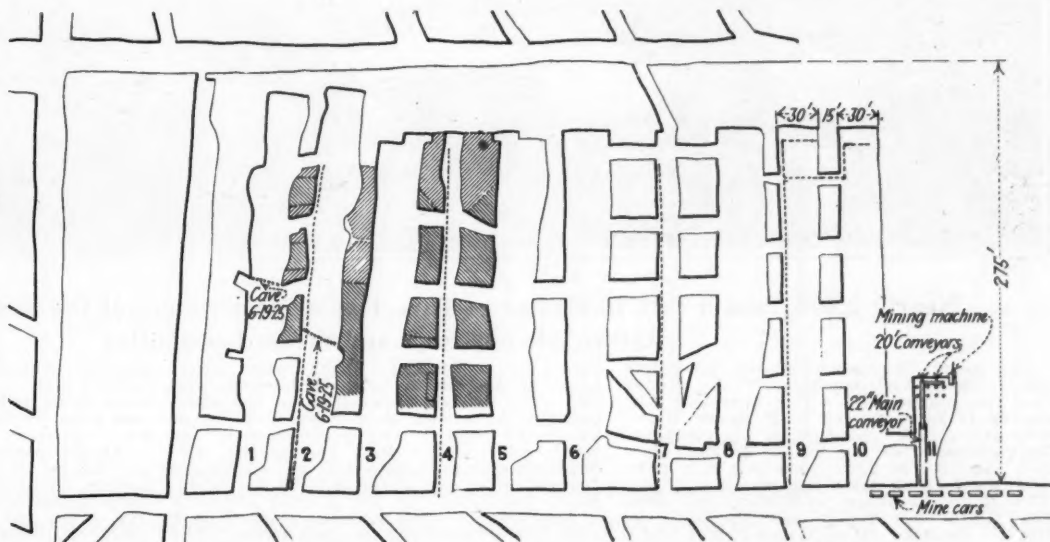
The rooms are worked by two 8-hr. shifts. A stopwatch time study during eleven cycles on three consecutive days showed that 38 per cent of the time was consumed in preparation, 47 per cent in loading, and 7 per cent in moving and adjusting the conveyors. The rest of the time, or eight per cent, was without productive result. The preparation included cutting, drilling, shooting, and timbering. The men are paid day wages provided for the various occupations by the union scale.

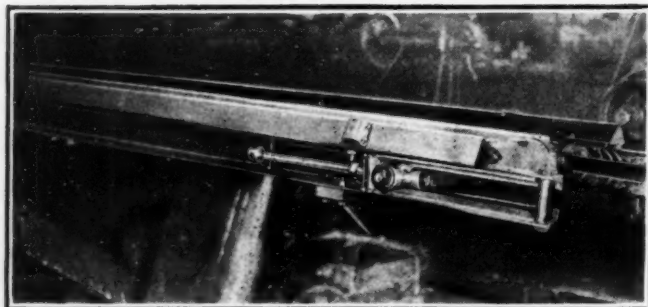
According to C. L. Watkins, vice-president in charge of operations, results so far obtained indicate that the two-room method will prove the most economical for his company's condition. With that system one entry man and one main conveyor serves two rooms, and

**FIG. 5**

#### Belts Were Tried Out Here

Coal from these eleven rooms in Moss Creek Mine No. 21, Marsteller, Pa., was brought to the entry by belt conveyors. A system of advancing two wide rooms with a narrow pillar between by the use of one main conveyor seems to be the most economical method. Belt conveyors are used in room-and-pillar work in two other mines of the Pennsylvania Coal & Coke Corporation.





**Fig. 6—Take-Up End of 20-Ft. Conveyor**

A screw adjustment of 6 in. is provided for the take-up pulley. An important feature of the construction is a tail piece which is fastened to the bearing and keeps the opening between the upper and lower strands of the belt covered thus preventing the entrance of coal.

there is less trouble in keeping the faces advanced equally, than with the three-room method.

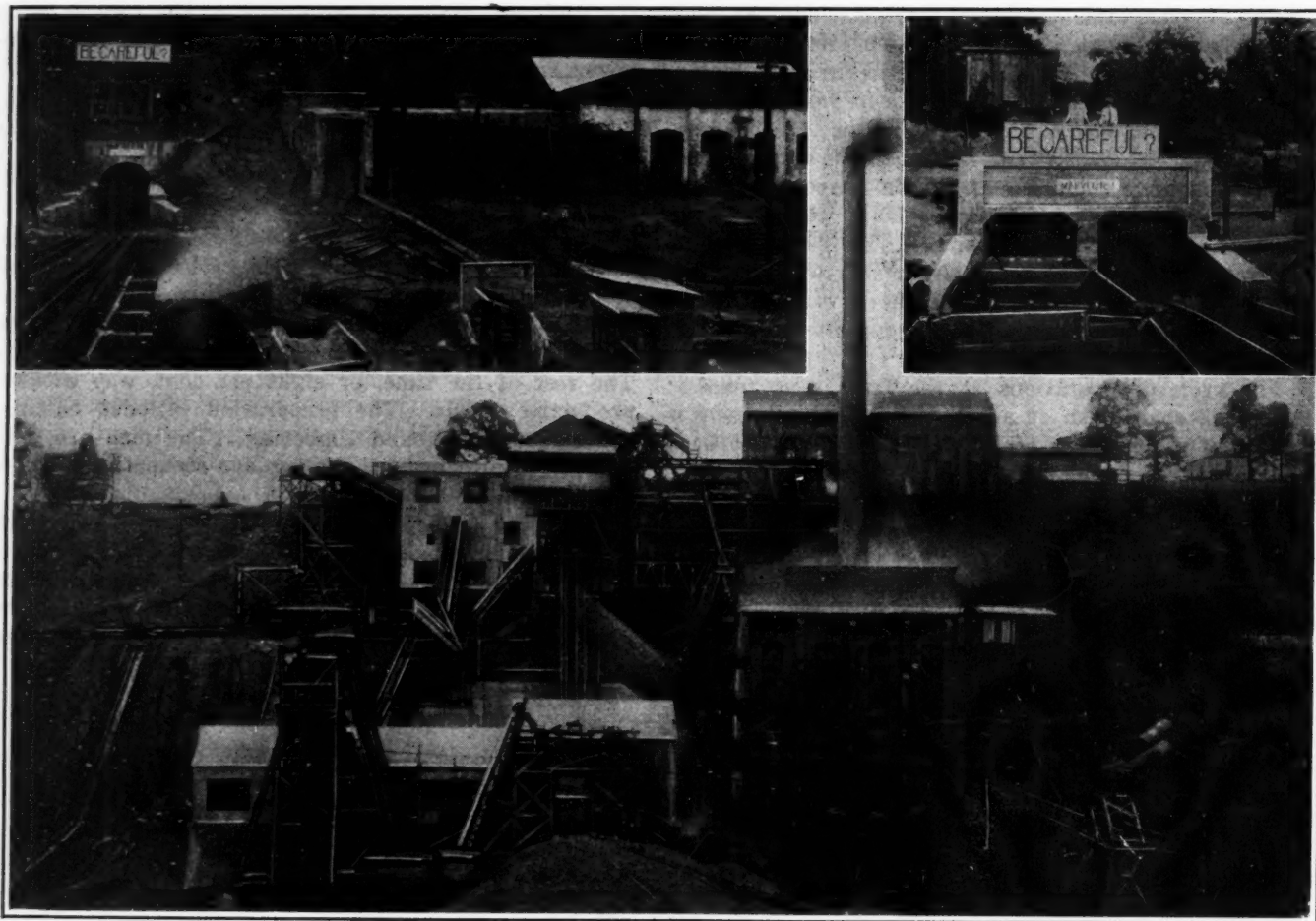
In roof where the caves normally break square across the last stump, the usual 25-ft. pillar may be drawn.

In roof where the caves frequently pass the stump, as at the Moss Creek mine, a narrow pillar must be left. One of the most successful applications of the belt conveyors has been in drawing heading stumps, chain and barrier pillars.

The accomplishments of the Pennsylvania Coal & Coke Corporation with room conveyors in low coal is but another instance pointing to the final elimination of the mine car from the face in low seams.

A COMPREHENSIVE PROGRAM of standardization of drafting room practice has been launched by the American Engineering Standards Committee. Reducing diversity not only in practice but in the materials, equipment and tools used for making drawings is expected to result in a more ready understanding of drawings by anybody for whom they are intended, in great savings in the draftsman's time and efforts, and in a more efficient use of drafting materials and filing cabinets for the storage of completed drawings.

## Alabama Coal Plant Handles Output of Three Slopes



### Nearly 2,000 Tons a Day Is Hauled to This Tipple and Washery of the Roden Coal Co., at Marvel, Ala., by Rope and Steam Locomotive

The lower illustration shows the power plant, tipple, and washery of the Roden Coal Co., Marvel, Ala. This operation was started 18 years ago by B. F. Roden, president and general manager of the company. Improvements to the top equipment gives it a capacity of 2,000 tons per day, however the largest day's run was 1,858 tons. The mine openings, consisting of three slopes, are back across a valley from the tipple. Haulage out of slopes Nos. 1 and 2 and over a steel bridge to the tipple is by

means of a 1,100-hp. double-drum steam hoist, located in the brick building on the hill. The electric generators, in the same building, have been shut down in favor of purchased power. The boiler-room smoke stack, which is of steel and of the self-supporting type, rises 150 ft. above its foundation on the upper side of the building.

At the upper left are shown slopes Nos. 1 and 2, with fan and first-aid house. The concrete portal of slope No. 2 (left fore-

ground) was damaged by a derailed trip coming out of slope No. 1. The Marvel mine is on pick work with mule gathering and rope haulage. The Clark seam averages about 48 in. at this mine.

At the upper right is slope No. 3 known as Marvel No. 3 mine. This is located several thousand feet from the tipple. The cars are handled on the slope by an electric hoist, but a dinkey steam locomotive pulls the trips from the slope landing to the tipple.



## Machines Keep Mine Books Up-to-the-Minute

By John C. McNeil, C. P. A.  
Louisville, Ky.

ALL COAL MINE operators like to know their total business down to date, as well as a distribution of the grades of coal produced, but heretofore this data could not be obtained daily, because the bookkeeper did not have sufficient time to prepare it. This article describes a system that yields it daily and without any additional effort on the part of the bookkeeper. Posting the records in the manner to be outlined gives the bookkeeper time to attend to worth-while matters and releases him from the endless detail that is ever present at the mine offices. This kind of a system is calculated to lift him out of the rut and make his services really valuable.

Most railroads require a separate bill of lading for each car and this is as it should be because it places every shipment on its own responsibility, so to speak. After the bills of lading are returned with the weights shown by the railroad and the coal is receipted for by the agent, the short-cuts provided by this system begin.

When the bills of lading are received with the weights, the file copy should be priced and extended in pencil and after these extensions have been made, the billing is ready for invoicing. The plan is to invoice the customer, write his monthly statement, post his ledger account and write and distribute the sales record in one operation. After all extensions have been made on the file copies of the bills of lading, an adding machine list should be made of the weights and amounts as shown by these bills of lading and the totals retained for proof purposes. When these totals have been obtained. Form 4, which is the Journal of Sales, is placed in the bookkeeping machine. A sheet of carbon paper the width of the ledger sheet passes over the top of this sheet and is kept in the machine, so that

the operator does not have to handle the paper. The bills of lading are arranged in alphabetical order according to the customers to be charged and are then numbered. It would be preferable to arrange them in this order and number them when the coal is billed so as to determine whether or not the office is short bills of lading for any particular car.

After the sales sheet is placed in the machine, the customer's ledger sheet, Form 3, and the accompanying Statement of Account, Form 2, are taken out of the tray and placed in the machine, with another sheet of carbon passing between the Accounts Receivable Ledger and the Statement of Account. Then an invoice is taken (Form 1) and placed over the carbon which is over the Statement of Account. Since these carbons are permanently fastened to the machine, the operator does not have to handle them. The principal part of the work becomes merely that of writing.

After the forms are in the machine, the operator picks up in the Pick up O. B. column on the ledger, the last balance due by the customer as shown on the Old Balance column of the Statement of Account and then moves across the Invoice to the left side, writing in the date, car initial and number, bill of lading number, grade of coal, price, tons and amount in the item column.

### REGISTER ADDS ITEM COLUMN

An adding register is kept over the item column which totals the amounts of items and when all bills of lading for one customer have been entered on the Invoice, all that is necessary is to clear this amount out of the item register and write it in the Total column on the Invoice. Through a cross-totalizing mechanism on the bookkeeping machine, this amount is added to the Old Balance which has been picked up and this amount is copied out of the cross-totalizing mechanism into the New Balance column on the statement. Unless this balance is cleared out correctly, the sign of clearance cannot be made and it is necessary to correct the

**CENTRAL COAL COMPANY**

Form 4

JOURNAL OF SALES MINE NO. 1 FOR *Aug. 14, 1925*

DATE	CAR IN & NO.	BL NO.	GRADE	PRICE	TONS	DEBITS		CREDITS	BALANCE DUE	O. B. PICK-UP	CUSTOMER DEBITED	O. B. PROOF	BLOCK SALES		EGG SALES		SCREENINGS		RUN OF MINE																						
						DETAIL	TOTAL						TONS	AMOUNT	TONS	AMOUNT	TONS	AMOUNT	TONS	AMOUNT																					
Aug 14 25	L A B 77881	8407	B1A	2.45	48.50	128.25				12,350.60			48.50	128.25																											
Aug 14 25	L A B 78450	8407	B1A	2.45	48.50	128.25							48.50	128.25																											
Aug 14 25	L A B 78840	8407	B1A	2.45	48.50	128.25							48.50	128.25																											
Aug 14 25	L A B 79742	8407	B1A	2.45	48.50	128.25							48.50	128.25																											
Aug 14 25	L A B 80548	8407	B1A	2.45	48.50	128.25							48.50	128.25																											
Aug 14 25	L A B 80748	8407	B1A	2.45	48.50	128.25							48.50	128.25																											
Aug 14 25	L A B 82750	8408	B1A	1.25	52.10	65.13									52.10	65.13																									
Aug 14 25	L A B 82848	8407	B1A	1.25	50.80	63.50									50.80	63.50																									
Aug 14 25	L A B 82882	8410	B1A	1.25	52.10	65.13									52.10	65.13																									
Aug 14 25	L A B 83030	8411	B1A	1.25	54.00	67.50									54.00	67.50																									
Aug 14 25	L A B 85640	8412	B1A	2.50	45.50	113.75							45.50	113.75																											
Aug 14 25	L A B 85912	8413	B1A	2.50	45.50	113.75							45.50	113.75																											
Aug 14 25	L A B 87724	8414	B1A	2.50	51.00	127.50							45.50	113.75																											
Aug 14 25	L A B 87745	8415	B1A	2.50	46.25	115.62									46.25	115.62																									
Aug 14 25	L A B 88550	8415	B1A	1.25	44.00	55.00									44.00	55.00																									
Aug 14 25	L A B 89150	8417	B1A	1.25	52.10	65.13									52.10	65.13																									
Aug 14 25	L A B 89450	8418	B1A	1.25	54.00	67.50									54.00	67.50																									
Aug 14 25	L A B 89718	8419	B1A	2.50	38.50	96.25									38.50	96.25																									
Aug 14 25	L A B 89925	8420	B1A	2.50	37.50	93.75									37.50	93.75																									
Aug 14 25	L A B 90425	8421	B1A	2.50	38.50	96.25									38.50	96.25																									
Aug 14 25	L A B 92640	8422	B1A	1.00	55.10	68.87									55.10	68.87																									
Aug 14 25	L A B 93120	8423	B1A	1.00	55.10	68.87									55.10	68.87																									
Aug 14 25	L A B 93777	8424	B1A	1.00	55.10	68.87									55.10	68.87																									
Aug 14 25	L A B 93946	8425	B1A	1.00	55.10	68.87									55.10	68.87																									
<p>INVOICE</p> <p>THE BARLAN COAL COMPANY P. O. Box 1070 &amp; Walnut St., Louisville, Ky.</p> <p>TO THE ORDER OF CENTRAL COAL COMPANY</p> <p>DATE: <i>Aug 14, 1925</i></p> <p>AMOUNT: <i>12,350.60</i></p>												<p>STATEMENT OF ACCOUNT</p> <p>THE BARLAN COAL COMPANY P. O. Box 1070 &amp; Walnut St., Louisville, Ky.</p> <p>IN ACCOUNT WITH CENTRAL COAL COMPANY</p> <p>DATE: <i>Aug 14, 1925</i></p> <p>AMOUNT: <i>12,350.60</i></p>										<p>LEDGER</p> <p>THE BARLAN COAL COMPANY P. O. Box 1070 &amp; Walnut St., Louisville, Ky.</p> <p>DATE: <i>Aug 14, 1925</i></p> <p>AMOUNT: <i>12,350.60</i></p>										<p>RECEIVABLE LEDGER</p> <p>THE BARLAN COAL COMPANY P. O. Box 1070 &amp; Walnut St., Louisville, Ky.</p> <p>DATE: <i>Aug 14, 1925</i></p> <p>AMOUNT: <i>12,350.60</i></p>									

**Bookkeeping Machines and the Use of**  
**These Forms Enable the Mine Accountant to Record Daily the**  
**Total Business Done and the Distribution of Each Grade of Coal Produced**

error before proceeding further. The items written on the Invoice are copied on the Statement, Ledger and part of the Journal of Sales in this operation.

As it is desirable that the distribution by grades be shown in tonnages and amounts, these items are written in the respective columns on the distribution side of the sales journal.

The machine adds vertically as well as horizontally and when the items are written, the figures in the respective columns are being added so that when the last item is written, the vertical totalizers contain the totals for each column. Inspection of Form 4 shows how these vertical totals are taken. It will be observed in the line Totals for Today the total tons and total debits are shown. These items should be in agreement with the predetermined totals as shown by the adding machine list of tonnages and amounts of bill of lading extensions. If the work has been correctly done these totals will be in agreement.

#### FURTHER ACCURACY ATTAINED

It will also be observed that the Balance Due and Pick-up O. B. columns have totals also. The total of the Pick-up O. B. column added to the total debits for the date should be in agreement with the Total of Balance Due. As a further aid to accuracy, the Pick-up is repeated on the sales journal and this is again picked up from the statement so that if the two Pick-up columns are in agreement, it is a further proof that the account has been correctly handled. If the two totals do not agree a simple line comparison will point out the account having the error and this can be corrected.

Attention is called to the distribution side of the sales journal, containing the distributions by grades and amounts. The totals of these respective distributions agree with the total tonnages and amounts on the debit side of the Journal of Sales.

The lines Previous Totals and Totals to Date This Month show how the figures may be made cumulative so that the line Total to Date This Month contains the figures for the month's operations. These items should be brought forward from day to day. By doing this, the posting at the end of the month of the debit to Accounts Receivable account in the general ledger and the corresponding credits to the four sales accounts.

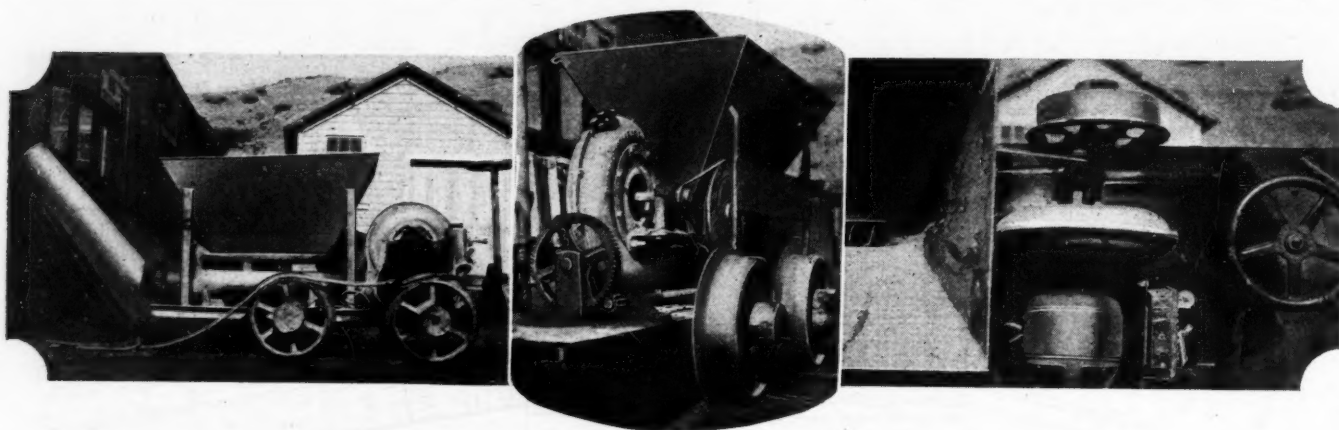
After the day's billing is over, the ledger is posted, the monthly statements against customers prepared, the sales journal entries made with proper distributions and all of this has been done in one operation with proven balances and totals. Invoices can be mailed out promptly with bills of lading attached. It is not necessary to keep copies of invoices, because the ledger account carries these copies in alphabetical order by customers and the sales journal carries these statements in chronological order. At the end of the month, there is nothing to do but mail out the statement, as everything is posted up.

For a mine loading 1,000 to 1,500 tons per day, which means 25 to 35 cars per day, about an hour per day is all that is required for the bookkeeper to extend the amounts of the invoices, make the invoice, post the ledger, write the customer's statement, write and balance his sales journal and obtain totals for the day and for the month to date.

Control of the accounts receivable is kept by a control card handled in the same manner as an individual ledger account. This is debited with all charges and credited with all credits and the card is balanced each day automatically, so that this card shows the total due by customers down to date. The balances shown by the individual ledger cards should, of course, be in agreement with the balance as shown on this card.

This system is bound to speed collections because the statements against customers, proved and balanced, can be placed in the mails just as soon as the last car is charged. There is no waiting on trial balances, etc.

No good operator desires to go back to the old expensive days of pick mining, solid shooting and mule haulage and there is no reason why the savings made for the mine through the use of modern labor-saving machinery cannot be extended with equal profit to the office. Mechanical devices in the office, properly installed, reduce office overhead, make the office more efficient and, in fact, makes the bookkeeper a producer, instead of a historian. One of the troubles of the coal trade today is lack of knowledge of costs. Of course, these costs can be obtained accurately through pen methods, but knowledge acquired in this manner is history and water that has gone over the dam cannot be saved.



#### With This Rock-Duster No Nozzleman Is Needed

At Reliance, Wyo., the Union Pacific Coal Co. has a rock-dusting machine with control at the front end. Thus constructed, the man who operates the nozzle is well away from the dust blast and escapes coating his lungs with the flying dust. He is also where he can attend to the operation

of the hopper and the manipulation of the switch. A vertical side elevation is shown on the left and vertical quarter elevation in the center. On the right is an almost plan view showing the wheel, reducing gear and the shaft which latter at the rear end of the machine has a gear which meshes

with another on the periphery of the blast pipe. Consequently a twist of the wheel changes the direction of the blast at the will of the operative. A short part of the feed screw at the bottom of the bin can be seen in the view at the right in this illustration.



## Coal Mining Engineer Is Chosen President of A.I.M.E. at 133d Meeting in New York

**A** COAL MAN—Samuel A. Taylor, consulting engineer of Pittsburgh, Pa.—was elected president of the American Institute of Mining & Metallurgical Engineers for 1926 and a number of facts interesting to coal men were brought out at the 133d meeting of the Institute in New York City, Monday, Feb. 15 and 16. The sessions ran through to Feb. 18. A good many engineers and operators from bituminous fields were present together with a handful of anthracite representatives.

After Tuesday's meeting the board of directors re-elected Dr. H. Foster Bain, secretary, and T. T. Read, assistant secretary. Mr. Read is now director of the safety service of the Bureau of Mines at Washington. He joins the Institute March 1. The board announced the fall meeting for Pittsburgh, Pa., Oct. 4, 1926, and a regional meeting for the Transmississippi sections in Denver, Sept. 20. The officers elected Tuesday in addition to President Taylor were: Birch O. Mahaffey of St. Louis, Mo., and Carl A. Meissner of New York vice-presidents and L. K. Armstrong of Spokane, Wash., W. Spencer Hutchinson of Boston, H. A. Guess of New York, Seeley W. Mudd of Los Angeles and Reno H. Sales of Butte, Mont., directors.

Secretary Bain, of the Institute, announced in the Tuesday business meeting that regional secretaries would be provided so as to increase the interest of the local organizations. B. F. Tillson proposed that a change be made from the present practice of leaving nominations to the nominating board. The plan he proposed would give the full membership an opportunity to express its will. At present only one name is presented for each office and what that name shall be is decided by a committee of three from the local section, one of the committee being an ex-president of the Institute.

John A. Garcia said the system of nominations was not democratic but advocated its continuance because it had worked well and resulted in the appointment of good men. R. V. Norris advocated that the proposal be voted down and "voted down hard." Mr. Tillson's motion when put to the vote was unanimously rejected.

### STATUS OF COAL INDUSTRY

At the Tuesday afternoon coal meeting H. N. Eavenson reported for the coal and coke committee on the status of the coal industry, predicting that the production curve of oil would soon begin to sag and tended already in that direction, that in three or four years the production of coal would progress upward at its old rate of increase. He showed that other industries such as the production of ingots and copper were as hopelessly below capacity as coal if not more so.

Graham Bright gave the result of a questionnaire on the use of loading machines in bituminous mines showing that of 49 replies, 22 were from union and 27 non-union mines. Of 43 replies, 38 reported no opposition from employees. Six union mines reported trouble with the union and one no trouble. Of 34 answers, 15 reported decreases in the production of lump coal, 12 an increase and 7 no change.

Evaluation of coal formed the subject of an address

by R. H. Sweetser who said that the relative value of coal should be determined in the same way as the relative values of iron ores. One per cent ash in coal increased the cost of pig iron 30c. per ton. One company was paying 75c. above market price to get a coal 3 to 3½ per cent better than that of the general run of the market. Mr. Sweetser pointed out that 1 per cent of ash represented nearly one shovelful of slate to a ton of coal. Mr. Garcia wanted an evaluation of coal land made on somewhat similar considerations.

Thomas Fraser's description of the air-sand process of cleaning coal was read by J. J. Rutledge.

Prof. S. W. Parr declared that the resins in coal have little or no coherence when carbonized and do not make coke. That was the function of bituminic coal. A. C. Fieldner said that Rheinhardt Theissen had noted that the attritus bands in coal would not coke satisfactorily but anthraxylon, which is made from the woody parts of coal, fuses well and cokes freely.

### VENTILATION DISCUSSED

On Monday opening the first meeting of the ventilation committee George S. Rice paid a tribute to the coal industry for having taken the first and most significant steps in the science of ventilation. However, some of the other industries now have ideas and experience to offer of which coal men might with advantage avail themselves.

E. A. Holbrook said that the lack of information about cardinal facts in ventilation was well illustrated by a colloquy between an inspector and a mine manager. "What's your water gage?" queried the former. The prompt reply was "We don't need one. *Our* mine's dry." The need of the coal industry is to obtain and absorb some of the facts that manufacturers, other societies interested in ventilation and the British mining associations have discovered by diligent inquiry and experimentation. Graham Bright reported that a committee on mine fans has been formed of manufacturers and fan users including in the latter A. B. Kiser and G. E. Lyman.

A paper that received much favorable comment was presented by L. W. Huber. In brief he said that as a mine had a variable resistance due to the passage of trips and the opening of doors, a fan which did not work with a reasonably even efficiency, despite these changes in condition, was undesirable. The fan that could meet a change in pressure without an undue change in volume delivered or in horse power required for constant speed was the fan best suited for application.

Mr. Huber said that the forward and radial tip blades did not have the stability of the paddle-wheel or partial-backward curved blades and that the full backward-curved blade was the most stable of any. It appeared to him that the last-mentioned blades which were driven at high velocity had the further advantage that owing to their high speed they could be driven direct-connected. Furthermore he said, the fan with the backward-curved blades was the most efficient. Mr. Bright suggested that the fan could have its speed regulated

to suit the resistance of the mine as that resistance changed in the course of the mine's history.

Mr. Tillson advocated a study of the propeller-blade fan that had been used recently in South Africa and had given water gages between 3 and 6 in. It was said that the manufacturer should provide a graph showing the characteristics of the fan as a protection to the client who wanted to know if the fan measured up to what might be expected should the water gage of the mine vary somewhat from what was anticipated. It was said also that it should be provided as a means of making the most economical use of a fan. Mr. Bright proposed that each fan have the characteristics on the name plate graphically portrayed. Another suggested a tabulation that would convey the same story.

#### PITOT TUBE RELIABLE INDICATOR

F. R. Still, of the American Blower Co., said that the backward-curved blades had to be rotated 50 to 150 per cent faster than the forward-curved blades and that the construction of the former was weaker than that of the latter. To get a 5-in. water gage with such a fan a tip speed of 7,000 ft. per min. would be necessary which would be a great strain on the fan structure. Discussing the measurement of air he said that he had found that by making the holes in pitot tubes of a diameter not larger than 0.02 in. he had been able to get the true static pressure as opposed to that of impact. He had found the pitot tube a much more reliable indication than any anemometer. At speeds of 1,500 ft. per min. the anemometer would be strained and unreliable whereas speeds of 4,000 to 5,000 ft. per min. are not unusual. He said that one reading of a pitot tube is enough to gage the quantity of air passing through a given pipe or passage when it has been properly calibrated but only so long as the speed above is changed. When the water gage is lowered or raised then the reading of the pitot tube will have to be interpreted by complete readings for every part of the section taken at that gage. Mr. Still said that the backward-curved fan of the same capacity as a forward-curved fan might cost 75 or even 100 per cent more than the latter.

G. E. McElroy, ventilating engineer of the Anaconda Copper Mining Co. and former member of the U. S. Bureau of Mines at Vincennes, Ind., read A. S. Richardson's article on the failure of operating performance to agree with the theoretical rating. Only occasionally could Mr. Richardson forecast what a fan will do when erected at any one of the Butte mines, where, it may be said, depths of 3,000 ft. and high temperatures are encountered.

Uncommonly interesting were the remarks of Ole Singstad, chief engineer of the New York-New Jersey Tunnel Commission. The tunnel when completed will be provided with a capacity of 3,761,000 cu.ft. of air per minute. That will be divided among 84 fans, three for each blower duct and three for each exhaust duct. One out of every three will be a standby unit. The air will be blown in by a duct under the roadway and liberated at distances of 10 to 15 ft. dependent on the grade. The air thus released will be sucked up into the return air duct.

The air ducts run half way from air shaft to air shaft, and the shafts are placed to accord with the grade of the tunnel and therefore in accord with the demand for air by which to neutralize the lethal gases delivered as the result of the incomplete combustion of gasoline. Fans of from 81,000 to 227,000 cu.ft. per min.

capacity will be used. From experiments at Yale made by Dr. Yandall Henderson it was ascertained that with 4 parts of carbon monoxide in 10,000, the air can be breathed with safety and comfort for one hour. The design of the ventilating equipment is based on that fact. The ventilating speeds and resistances were tested at Urbana in the University of Illinois, a special concrete tunnel being built for that purpose. Further experiments at Bruceton in the experimental mine where an oval track was built and eight automobiles were allowed to circulate confirmed what had been learned at Urbana.

It was found also that a fire in the tunnel would not cause smoke to spread more than 30 ft. Instead of the fire traveling from car to car, the draft being vertical from intake to return duct will remove the flames in a manner that will cause least danger. It is easy to imagine what would happen in a tunnel if a car took fire and the air traveled from the car past the other cars to the exhaust portal and in such prodigious volume as ventilation by a single current would make necessary. The size of the installation can be understood when it is said that the largest fan to be constructed in the world, which has, by the way, radial blades with the tips turned backward, has a capacity of 900,000 cu.ft. per min. One big fan in America has a 5-in. water gage and a capacity of 750,000 cu.ft. per min. The installed horsepower of the tunnel plant in New Jersey and New York will be 6,000 but only two-thirds of that will be put in operation except perhaps in emergencies.

In the afternoon the meeting on mine ventilation was held. George S. Rice presided. The first topic discussed was the ventilation of the Liberty Tunnel in Pittsburgh, Pa.

The first problem in ventilating this thoroughfare was a determination of the content of carbon monoxide (CO) in the tunnel atmosphere produced by motor vehicles. The second was a determination of the composition of the exhaust from automobiles. Several actual tests were made on the air in this tunnel while machines were passing. In the first the calculated content of carbon monoxide was 0.04 per cent and the actual analysis showed 0.041 per cent.

#### ACTUAL RESULTS OF TESTS

With motor trucks 0.07 per cent was expected and analysis showed 0.05 per cent. In all cases the actual results obtained checked those calculated within fair limits. In most instances the larger discrepancies were realized on the longer tests when the air within the passage had a chance to purify itself somewhat by diffusion as well as by circulation. Air movements induced by the passage of vehicles in the longer tests carried away much of the foul gas generated.

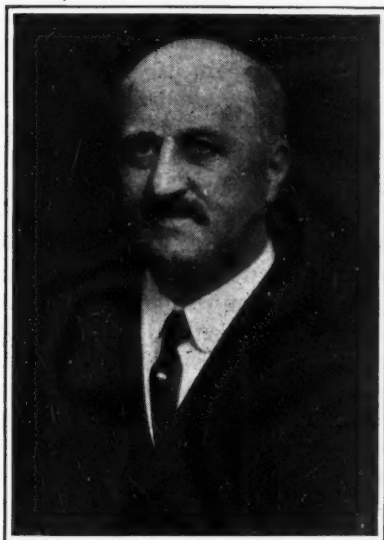
Air drawn from this tunnel is discharged upward from comparatively high stacks at high velocity while that forced in is drawn from points near the ground. There is thus small chance of the bad air short-circuiting and being returned to the tunnel. No special provision has been made for caring for the condensation of humidity which in some tunnels, notably London subways, is at times bothersome.

An apparatus for continuously analyzing small percentages of carbon monoxide has been perfected and is being used as a part of the ventilation equipment of this tunnel. This depends for its operation on the heat generated from the oxidation of carbon monoxide to



carbon dioxide in the presence of a catalytic agent. This instrument is sensitive to as low an admixture of CO as ten parts in a million and will easily indicate one part in 100,000. Such an apparatus could easily be connected by relays to the equipment driving the ventilating fans in such a way that the quantity of air forced into the tunnel could be increased whenever the content of carbon monoxide rose above a certain predetermined percentage.

It was then stated that the committee on mine ventilation carefully reviews the results of work done on this subject throughout the world and attempts to



Samuel A. Taylor

select and co-ordinate such material as will prove useful to American mining men. A research fund has been established and some of the revenue from this source might logically be devoted to the work of this committee.

Dr. R. R. Sayers then stated that the carbon dioxide content of mine air could not be regarded as an index of its vitiation by the respiration of men and animals, although it had long been so considered. Air vitiation in mines may arise from other causes and will take place if neither men nor animals are present. Deficiency of oxygen sometimes causes trouble. Many men become unconscious if the atmosphere contains 9 per cent or less of this element, and most men succumb to unconsciousness or coma at 5 per cent of oxygen.

#### EFFECTS OF INCREASED OXYGEN

Percentages of oxygen higher than normal have no particular effect up to about 160 per cent. At a pressure of two atmospheres, making the weight of oxygen taken into the lungs approximately twice normal, animals die from lung irritation in about 48 hr. Divers using oxygen (not air) apparatus are liable to become foolish, or rather foolhardy, when the oxygen breathed becomes 125 per cent above normal.

In the atmosphere of a mine abnormal constituents are important. Methane or marsh gas has no particular physiological effect, however dangerous it may be from the standpoint of explosibility. Sulphur dioxide, although poisonous, is not particularly dangerous because its odor always gives warning of its presence. Oxides of nitrogen and hydrogen sulphide are highly toxic but not particularly dangerous except when the latter in high concentration paralyzes the sense of smell.

As small a quantity as  $\frac{1}{1000}$  per cent irritates the mucous membrane.

A true index of air vitiation is furnished by its content of carbon monoxide (CO). The index, or quantity that will give trouble under ordinary conditions, after 45 min. exposure, is 0.04 per cent. In 5 to 6 hr. 0.02 per cent will be felt. With 1 hr. of exercise 0.04 per cent may cause collapse. High temperature always increases the ill effects of this gas.

Because of the danger from these various gases it is highly important that every mine be well ventilated. Exposure to concentration of any poisonous gas should be avoided if possible. If necessary the gas mask may be used in poisonous atmospheres or those deficient in oxygen. Should a person be overcome he ought to be hurried into good air as quickly as possible and the prone pressure method of respiration applied. It is also highly important to keep the patient quiet.

Dr. Sayers said that in cases of carbon monoxide poisoning oxygen should be administered. A mixture of carbon dioxide and oxygen stimulates deep breathing, but authorities differ as to the advisability of using this mixture. If it is not ready at hand in case of emergency no time should be lost in procuring it, but pure oxygen should be administered at once.

Prof. A. C. Callen next outlined some of the high points in the contemplated work of the committee on mine ventilation for the ensuing year. These, among other things, include: A basis for determining mine resistance, determining a coefficient of friction along mine passages, a coefficient of friction for air in passing around bends, the effect of the use of guide vanes for conducting air around sharp corners, and the selection of suitable instruments for measuring the velocity of air as well as its static head.

#### AMERICAN VS. BRITISH PRACTICE

In discussing the report of the British Institution of Mining Engineers on the "Theory of Ventilation," Mr. McElroy asked, "Can a simplified formula for mine ventilation be developed?" The new formula as proposed in the report in question had been simplified only mathematically. The British Institution proposed the units of pounds pressure per square foot and cubic feet of air moving per second, whereas American engineers almost invariably employ inches of water and cubic feet per minute. The majority of mining men in this country believe that the American practice is preferable.

Mr. McElroy brought out another interesting detail concerning mine ventilation. This was to the effect that in metal mines not only are the volumes of air circulated much smaller than those employed in coal mine ventilation but the resistance offered to their flow is higher.

He then showed an interesting chart for determining the flow of air in mines. Although this chart may leave much to be desired, it nevertheless affords an excellent check on more elaborate and exact calculations.

Mr. Tillson then stated that present means of measuring air flow might prove inaccurate and inexact. He favors the use of orifices as a means for determining the flow of air and gases. In reply it was stated that much work of this nature had already been done by the American Society of Mechanical Engineers and that the results obtained by them might prove of interest to mining men.

Frank Haas stated that mine ventilation was receiv-

ing intensive study both in this country and abroad. Costs of ventilating mines in the United States were too high, this in many cases being the result of ignorance.

An objection was then raised to the use of the Pitot tube for measuring air velocities on the ground that its manipulation was delicate and that it sometimes gave highly erroneous results. In reply Mr. McElroy stated that it was his belief that best results could be obtained with this instrument only if the volumes of the air spaces between the static and velocity nozzles and the pressure gage were made equal. Unequal volumes in the connecting tubes sometimes led to violent fluctuations in the liquid column and great difficulty in reading it accurately.

#### "BOOSTER" AND "BLOWER"

A study of booster and auxiliary fans was next suggested as a subject for investigation by the ventilation committee. Such fans are opposed by some engineers. On the other hand new methods of mining make them extremely convenient and almost dictate their use in some cases. In the discussion that followed a sharp line of distinction was drawn between the "booster" and the "blower." The booster was considered as an auxiliary fan of moderate size furnishing air to an entire split or section. The blower is a small fan ventilating a single heading or other passage by means of canvas or other flexible tubing.

Mr. Rice stated that in some cases boosters are used in place of brattices. He recalled an instance where two fans were thus used, both being electrically driven. The return of one became the intake of the other and a dangerous condition was thus created.

Dr. J. J. Rutledge then stated that if we are to have any improvement in present methods of mining we must have single entries. These can only be ventilated by use of a blower. In many cases where such machines are now used the air sweeping the face is purer than where ordinary crosscuts between a pair of headings are used.

Mr. Rice felt that boosters were sometimes justified in extreme cases but believed that for such places air-driven machines were safer than those connected to electric motors. Such machines are not forbidden in England. When a fan of this kind is stopped a splendid opportunity is presented for gas to collect which may be driven back upon the motor when the fan is again started.

#### WHAT IS A GASSY MINE?

The question was then asked: "Could not this committee define in a quantitative way exactly what is a gassy mine?" It was remarked that some time ago the Bureau of Mines had an opportunity to formulate such a definition but sidestepped the question—perhaps wisely. It was also pointed out that at present no convenient, reliable, accurate means for determining the gas content of mine air is available for use by the ordinary mine man.

It was also asked: "Should the work of the committee be limited or circumscribed by existing state laws? Should not the Institute rather point the way to better standards?" In reply Mr. Haas stated that he would treat existing statutes with all due respect and would hesitate to recommend changes unless such alterations were sorely needed. It was also stated that although there is little uniformity in the statutes of the various

states it can hardly be hoped that uniform mining laws will be enacted. The Bureau of Mines once took some tentative steps in this direction but its motive and purpose were misunderstood and the matter accordingly was dropped.

The new president, Mr. Taylor, was born in what is now East McKeesport, Pa. about ten miles east of Pittsburgh, in 1863. He was educated in the public schools, the Polytechnic Institute in Old Allegheny, and at the Western University of Pennsylvania, now the University of Pittsburgh, graduating in the class of 1887 with the degree of civil engineer. He received the honorary degree of doctor of science from the University of Pittsburgh in 1919.

In July, 1887, he began work for the Carnegie Steel Co. at the Homestead plant, then under the management of Julian Kennedy, as draughtsman in the new structural steel department, where he continued until September, 1888, when he resigned to accept the position of assistant engineer of construction of branch lines of the Pennsylvania Railroad, with headquarters in Greensburg, Pa. He continued in that position until October, 1893, when, on account of the business conditions, the department was temporarily disbanded.

He then began the practice of his profession as a civil and mining engineer in Pittsburgh where he has had his offices ever since. For many years he carried on the general practice of engineering, designing and building water works and sewer systems, street and road improvements, railroads and buildings, as well as designing and building a number of coal mines and coke plants. He was for many years the engineer for about ten municipalities in the western part of the state, and was engineer for a number of coal companies. About 1900, he, with associates, became interested in the development of coal properties and opened up a number of coal mines, and from this time to the present he has devoted most of his time to coal mining and its allied industries as consulting engineer and in a managerial capacity.

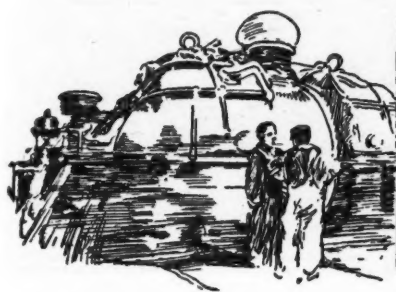
#### HELD MANY IMPORTANT POSITIONS

Mr. Taylor has served on several national commissions pertaining to mining matters, as well as on several state commissions of public interest. He has been one of the consulting engineers of the U. S. Bureau of Mines ever since the Bureau was established. He also served as technical adviser to Dr. Harry A. Garfield, U. S. Fuel Administrator during the World War. During 1918, he was loaned to the Canadian government to assist that country in their fuel matters. He served with U. S. Coal Commission in 1919 to adjust the labor scale, also served on the board of engineers which made the valuation of coal lands and properties for the Coal Commission in 1922.

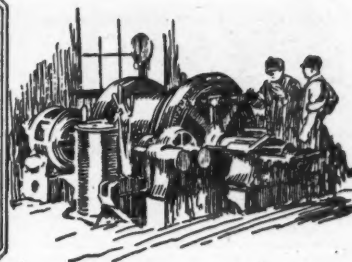
He was president of the Coal Mining Institute of America in 1911, president of the American Mining Congress in 1913, and president of the Engineers Society of Western Pennsylvania in 1914.

He is a member of those societies, and also the American Institute of Mining and Metallurgical Engineers, American Society of Civil Engineers, American Water Works Association, American Society for the Advancement of Science, American Society of Political and Social Science, National Forestry Association, International Navigation Congress, a fellow of the National Geographical Society, and a member of the chamber of commerce of Pittsburgh, Pa.





## Practical Pointers For Electrical And Mechanical Men



### Heavy Grating Keeps Surface Water Out of Mine Building

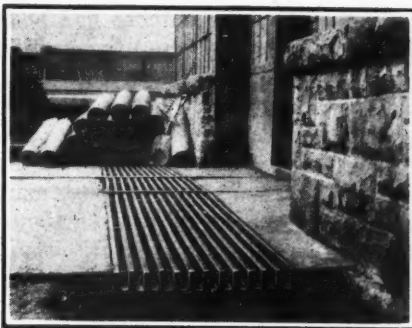
Many mine buildings are so built that their floors are at approximately the same level as the ground outside. Handy though this arrangement may be it sometimes leads to trouble because surface water may find its way into the building. A flood outside then means also a flood within.

In the accompanying illustration may be seen the heavy grating that guards the entrance to a large mine shop in Kentucky. This shop is built in a community that is generously provided with good roads and the pavement has been carried clear to the shop door, so that trucks and wagons could be driven into the building. Much time and labor is saved by this provision.

In order to prevent water on the pavement entering the building a trench was dug and concreted, immediately in front of the door. As the ground upon which the shop was built is somewhat sloping it was an easy matter to give this trench sufficient slope to carry away all the water that enters it.

The grating itself is made up of bars of strap iron each 1 x 4 in. in cross-section. These are fastened together by  $\frac{3}{4}$ -in. bolts or rods which are passed through  $\frac{3}{4}$ -in. pipe spacers about 1 $\frac{1}{2}$  in. long. The trench is about 30 in. wide and the grating is supported by 80-lb. rails extending across it, one rail under each end of each grating section. There are three of these sections, one between the rails of the mine car track that enters the shop and one upon either side of it. The side or flank sections, which are long compared with the one in the center, are supported by transverse rails in the middle as well as upon either end.

The top of the grating is made flush with the concrete paving and slightly below the top of the track rails. By this arrangement wagons, trucks or cars may enter or leave the shop as may be desired but surface



**Grating Protects Shop Floor**

This grating spans a drainage trench in front of the shop door. Thus while mine cars, teams or motor trucks may enter or leave this building at will, surface water is effectively trapped and drained off.

water is effectively trapped and drained off. No matter how hard may be the rain outside the shop floor is always reasonably dry. Furthermore, this grating was inexpensive and was built to suit the local conditions in the shop that it serves.

It is not intended to convey the idea that the kind of grating here described is in any sense a new scheme. Such gratings have long been used for various purposes. The application described however, is novel and in use is highly effective.

### Keeps the Pin in Place

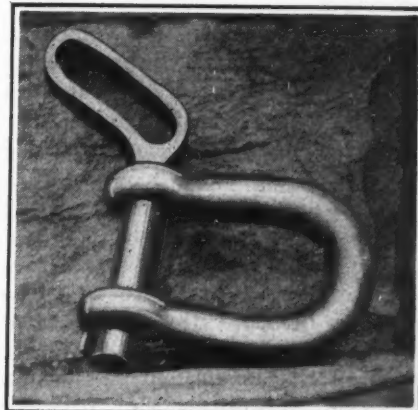
Many have been the devices employed for keeping the pin of a clevis from coming out while the clevis is under stress. Of these the old lynch pin or the later cotter pin is perhaps the most common. Both of these were effective but required some time for their withdrawal, furthermore they were liable to be lost.

An ideal fastening of this kind would be one that would hold the clevis pin in place without failure so long as the clevis is under stress but which can be withdrawn almost instantly when withdrawal is desirable without loss of time and without

the use of tools. It is probable that the device here illustrated and described is not new, but it will be new to many of our readers and is here set forth for what it is worth.

The illustration shows a clevis provided with a pin that is fitted with a short tongue or feather welded onto one side of its lower end. The lower opening in the clevis body is a "keyhole," that is, it is a circular opening with a slot or rectangular opening extending from it toward the body of the clevis. This is made big enough to permit the short feather on the end of the pin to pass through it readily, yet does not weaken the clevis. The handhold or ring on the top of the pin is not circular but elliptical or flattened and extends in a direction parallel to that of the feather on the end.

When it is desired to remove the pin from the clevis it is only necessary to turn the pin until the handhold is parallel with the clevis body. In this position the feather will easily pass through the lower hole while in any other position the pin cannot be withdrawn. This device is particularly handy on the end of haulage ropes or on draft chains by which cars are hauled.

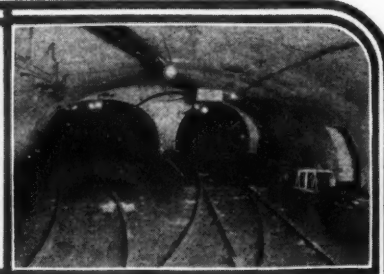


**Non-Releasing, Yet Easily Released**

When the pin of this clevis stands in the position here shown the feather upon its lower end prevents its withdrawal. Turning the pin through an angle of 180 deg., however, allows it to be withdrawn with ease. The handhold on the top of the pin serves as an indication of the position of the feather.



## Underground Operation



### Arc Believed to Have Fired Gas at Castle Shannon Mine

On Jan. 23, at about 10:30 a.m., six men were more or less severely burned in an explosion of gas at the dead end of Tenth Face entry in the No. 3 mine of the Pittsburgh Terminal Coal Corporation at Castle Shannon, near Pittsburgh, Pa. The agent of ignition is believed to have been an arc caused by the unhooking of the cable nip of a cutting machine from the trolley wire which had been extended to the last breakthrough, about 80 ft. from the face. At the time, the machine was backing out of the place after having completed a cut. The machine is of the permissible type. In this mine closed lights and permissible powder are used exclusively and the roadways are rock-dusted.

There was no lack of air in the entry for it is one of the two intakes in a triple-heading projection which has been developed to a point about 2,300 ft. from an intake air shaft. The last two crosscuts were left open except that in the outby crosscut was hung a canvas, and a chute which lay further in was not blocked by a door. It is believed that the air made a clean sweep to the return without going to the last crosscut.

On the day before the explosion, a cut had been made which exposed, but did not penetrate through, a clay vein. The assistant mine foreman, in compliance with the mining law, accompanied the loader to the place, tested for gas and, finding none, bade the latter put in a test hole. He is reported to have admitted finding gas after the test hole had been drilled. However, he must have believed the quantity being given off was insufficient to cause an explosion, forgetting that little or no air found its way to the face. When the cutting machine crew came he is said to have given orders to the men to go ahead with the cutting, which they did. In the meantime he retired to the last crosscut, where

he was when the explosion occurred.

By the time the cutting had been finished a large volume of gas must have displaced the stagnant air near the roof and extended from the face to the last crosscut where the ignition apparently occurred.

When that happened only one man, the machine runner, was stationed inby of the last crosscut. He was at a point about 50 ft. from the face, sitting on the cutting machine which was then backing out from the place. Among the four men who were with the assistant foreman were the machine helper and the fireboss of the section who had arrived while the machine was in operation. He is said not to have visited the place because the assistant foreman had assumed responsibility for the operation. One of two loaders stood with the before-mentioned men in the crosscut and the other stayed on the entry at the point where the machine cable was attached to the trolley wire. It is thought that this man tampered with the cable nip causing an arc, the controller on the machine being open; otherwise no arcing would have resulted.

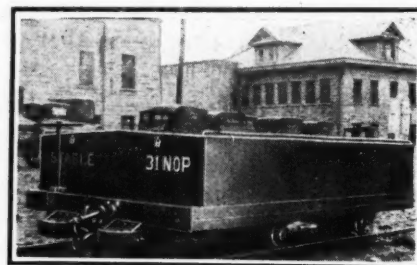
Inasmuch as the entry was being advanced into virgin territory air should have been conducted to the face by a brattice, particularly because a clay vein had been encountered. Lastly, the assistant foreman should have determined approximately the quantity of gas standing in the place by tracing the extent of its occurrence outby.

Following the explosion the following exhortations were made by the general superintendent to the mine superintendents: (1) Under no condition should two open breakthroughs be permitted on any entry; (2) Under no condition should canvas be depended upon for permanent stoppings, and (3) Under no conditions should the trolley wire be carried to within less than 150 ft. from the face or beyond an open crosscut.

### Closed Feed Cars Save Grain

Taking mule feed into the mine has heretofore presented its problems. When the feed was transported underground in ordinary grain sacks there was always some spillage and wastage. Furthermore, grain thus transported would absorb moisture, and if left and stored in the sacks it might mold. Again, sacked grain is exposed to attack by mine rats, and the loss sustained from the incursions of these animals may be great.

In the accompanying illustration is shown a covered steel stable or feed car employed at one of the big mines of Kentucky. This car is constructed specially for the purpose of transporting grain and other mule feed into the mine. It amounts practically



### Rat, Thief and Moisture-proof

A steel tank with sloping top covered with hinged doors which may be padlocked shut effectively protects its contents from moisture, rats, spillage and theft. This car may be hauled anywhere within the mines, and soon saves its cost in the protection it affords the feed of the mine animals.

to a covered steel tank mounted on a low car. As may be seen the covers are hinged and may be padlocked shut. Not only does a car of this kind protect its contents from moisture, but also from rats or from theft. It cannot be opened by unauthorized persons.

Two interesting details of construction appear in the photograph. One of these is the brake mechanism, which as may be seen, strongly resembles that employed upon the ordinary railroad freight car. The other is the hook on the end of the car, which is used to support the clevis of the coupling, thus preventing it from dragging along the track. Cars of this kind, save their cost.



## Book Reviews

### Will New Conditions Modify The Miner's Freedom?

As interesting as a novel will the recent publication "The Miner's Freedom" be to operators of coal mines. The author, Carter Goodrich, assistant professor of economics in the University of Michigan and Amherst Memorial Fellow in Economics, 1921-22, 1923-24, knows his subject quite thoroughly having acquired his knowledge at first hand underground as well as by a diligent study of technical literature. He has seen miners working under many conditions in the bituminous regions. He has devoured at least *Coal Age*, not only its editorials and articles but its news, its blurbs on the contents page and even its advertisements also. He writes like a coal technician with a full grasp of his subject and, withal, with a clearness and conciseness which carries the reader through the book without uncertainty as to his meaning and without a moment of weariness.

He opens his book, which has as sub-title "A Study of the Working Life in a Changing Industry," with the statement, "It is often said that modern society has chosen efficiency in production rather than richness in the working life; that it has chosen the possibility of fuller and more varied living outside working hours rather than the possibility of a creative life on the job itself." He then denies that there is any "choice" made and says this is "not only a false rationalization of the past but a real hindrance to intelligent thought about the future. Society makes no choices as such."

#### JOBS AS DULL AS FORD'S

He adds that "the countless individual decisions out of which have come mass production as efficient as that at Ford's and jobs as dull as those at Ford's have most of them been made without the slightest reference to the quality of the working life that would result." "There's no such thing as discipline in a coal mine; the miner is his own boss," he quotes as recognized slogans. He then denies that this is entirely true and recalls the colored loader in a West Virginia mine who drifted

back from the factory to coal mining as saying that in a coal mine, "They don't bother you none."

One is reminded of the story that W. J. German tells so well regarding a West Virginia loader who quit his work disgusted and disgruntled because the driver, the trackman, the shift boss and the foreman in turn cussed him out and one after another made him change the position of a prop until he had moved it from place to place no less than four times. That story doesn't suggest freedom from supervision and instruction. Nevertheless, the author is right in declaring that the miner's customs have made him extraordinarily free as to what he shall do, when he shall do it, when he shall come to work, when he shall quit his place and whether he shall put in his day in the mine or at the country fair.

#### WON'T HIRE MINERS

The author quotes "Industrial Management" where it says as he briefs it, "Don't hire former miners if you can avoid it. Their work has unfitted them for factory discipline. In the mines the possibility of constant supervision or of surprise tests does not exist. The coal miner is accordingly trained to do as he pleases. . . . Transplant such a man into a factory where production is speeded, and no imagination is required to picture what will happen. His 'personality' is 'so magnified' by the laxness of mine discipline that he chafes under the necessary restrictions of other employment. . . . The ex-miner resents all suggestions as to his working methods, resents all effort to compel continuous application and assumes in general a hostile attitude to all supervision."

Quoting *Coal Age*, Mr. Goodrich says, "Mining is still in a way a 'cottage' industry, only, the cottage is a room in the mines" and he adds "the miner's freedom is largely a byproduct of the very geography of the working places inside a mine." He goes on to elaborate the variety of the miner's daily work, his independent existence and his resentment of direction. As one miner he met said, "If there's anything that

gives me the willies, it's a boss standing and looking down my shirt collar."

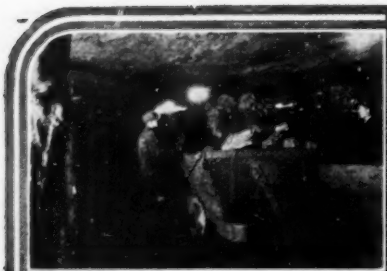
The first part of the book is on "The Miner's Freedom," the second on "The New Discipline." In the latter Mr. Goodrich shows that machines must introduce elements of factory management, though the Ford ideal can never be attained in the mine. "Surely no one," says the author, "is looking to the mines of today to see how the automobile factories are to be run but many are looking to Ford's for the mines of the future." He shows how coal mining had advanced immensely prior to the introduction of loading machines by quoting an article on the methods pursued before the Civil War, but says that the change is less than is about to take place and shows why this change is almost inevitable.

In the concluding chapter the author says, "Profits and prices, and to a less extent employment and wages and safety—it is chiefly in these terms and the others already suggested that the revolution in the mines is discussed; and certainly all these things should be considered as men weigh the gains and losses of the change and attempt to control its course. But for all these claims there are already spokesmen. . . . The purpose of the present study, on the other hand, is to place alongside these other problems an almost entirely neglected one—that of the effect of the change on the quality of the working life."

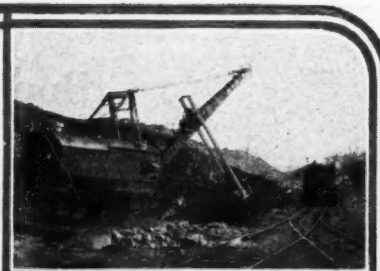
#### FREEDOM TO LOAF

Mr. Goodrich's plea will have few advocates. It is largely a plea for leisurely and inefficient operation and even incorrect and wasteful methods of mining, profitable in the end to none of the trinity of interests in coal mining, the public, the miner or the operator.

The miner's "freedom", as the author would define it, is a thing of no value to him or to anyone and really not worth the labor of writing and publishing a book in its defense, not entitled surely to 189 pages measuring 5 x 7½ in. Yet it is a well-written book, all the better because it has a single purpose and ideal. Too many books wander from subject to subject and do but weary without informing the reader. The publisher is Marshall Jones Co., 212 Summer St., Boston and the price \$2. R. DAWSON HALL.



## News Of the Industry



### Five-Year Agreement Ends Longest Strike In History of Anthracite Industry

The longest strike in the history of the anthracite industry is at an end.

Members of the joint negotiating committee of operators and miners, without advance notice to the public, returned to Philadelphia last Thursday, met secretly that day in separate sessions and the next afternoon affixed their signatures to an agreement to expire Aug. 31, 1930. This agreement had already been approved by the full scale committee of the union and was submitted to a special tri-district convention of the anthracite districts of the United Mine Workers at Scranton on Feb. 16. Ratification of the contract by that convention was accepted as a matter of course.

The principal terms of the agreement, which is printed in full on the opposite page, are:

(1) Extension of contract in effect immediately prior to Sept. 1, 1925, to Aug. 31, 1930, subject to annual readjustment after Jan. 1, 1927.

(2) Upon application of either operators or miners, modifications in the wage scale may be asked. Joint conferences to consider such modifications must start within fifteen days after the receipt of the proposals. If an agreement is not reached within thirty days after joint negotiations have been started, points in issue shall be submitted to a board of two men.

(3) This board will be allowed ninety days in which to reach a decision. In order to avoid a deadlock, it may enlarge its membership to an odd number, in which event a majority vote shall be binding.

(4) The demands of both sides on questions of efficiency and co-operation shall be submitted to the Board of Conciliation, exclusive of the umpire, to work out a reciprocal program of co-operation and efficiency.

#### Grant Brings Factions Together

Credit for bringing the warring factions together after all attempts to effect an amicable *rapprochement* appeared to have failed is given to Richard F. Grant, vice-president of M. A. Hanna & Co. and president of the Susquehanna Collieries Co. Mr. Grant, who is a past president of the Chamber of Commerce of the United States, did not enter the picture until Feb. 6. As he explained later, he waited until the political atmosphere had been cleared by the refusal of President Coolidge to take any action on the Copeland resolution requesting the President to invite the operators and the miners to resume negotiations.

On the date named, while the operators were pressing their campaign to appeal over the heads of John L. Lewis, international president of the United

Mine Workers, and his fellow officers to the rank and file of the anthracite workers, Mr. Grant journeyed from Cleveland, Ohio, to Scranton, Pa., to lay his program before Major William W. Inglis, chairman of the operators' negotiating committee. From Scranton he moved on to Wilkes-Barre, where he talked for hours with Mr. Lewis.

Mr. Grant next went to Philadelphia to see S. D. Warriner, chairman of the Anthracite Operators' Conference, and William J. Richards, president of the Philadelphia & Reading Coal & Iron Corporation. He persuaded the operators to call a conference in Philadelphia on Thursday. He persuaded Mr. Lewis to abandon his speech-making tour of the mining region and return to the temporary headquarters at the Bellevue-Stratford Hotel, to which Mr. Lewis summoned the district presidents and the full scale committee of the miners.

All day Thursday Mr. Grant acted as intermediary between the operators, holding secret conferences at the Ritz-Carlton Hotel, and the union representatives, closeted across the street at the Bellevue-Stratford. Mr. Grant made a suggestion here, argued for a concession there, insisted upon this point, ironed out misunderstanding over that and finally whipped the agreement into a form acceptable to both parties. It



**Joint Committee That Signed the Peace Agreement**

Seated, left to right: Richard F. Grant, John L. Lewis, Alvan Markle, W. W. Inglis and James A. Gorman. Standing: Andrew Matthey, Philip Murray, Thomas Thomas, A. M. Fine, Rinaldo Cappellini, George B. Hadesty, E. H. Suender, Thomas Kennedy, Jesse B. Warriner and Christ J. Golden.

© Wide World Photos.



was submitted to the full scale committee of the miners on Friday morning and indorsed without change.

At 1 o'clock that afternoon the operators' delegation crossed the street and went into joint session with the miners. In less than an hour the announcement was made that an agreement had been reached. Word was flashed to the mining region and scenes duplicating the armistice day celebrations of 1918 were repeated from Forest City to Minersville.

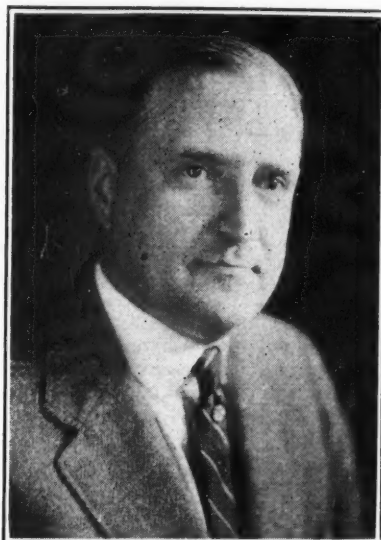
#### Grant Pricks Some Bubbles

It was only after spokesmen for various state and federal officials had begun to claim credit for the settlement that Mr. Grant consented to talk for publication. He then made the following statement:

"When a coal strike develops, many champions of the people with political hopes start to develop ways and means to capitalize the situation for their own benefit. The first thing to do is to convince the people of their general love for humanity.

"There is no publicity value in being a private lover, and so their love is proclaimed loudly. The next thing is to have a plan or to offer their good offices. This is done, so that later, when the strike is settled, they can point with pride to their helpfulness.

"Hundreds of plans have been submitted. Generally they follow the plan of the Ten Commandments, the Episcopal marriage ceremony or Mrs. Rorer's cook book.



Richard F. Grant

"These champions of the people accomplish nothing except to confuse everything and everybody and prolong the strike.

"For three days I have been the sole contact between operators and miners. Right at the start it seemed sure that a formula could be written to end the strike. My only fear was that some great friend of the people would have a heart-break and start loving out loud and spoil the party.

"I call attention to the great common sense and wisdom of President

Coolidge. It is my firm conviction that if he had yielded to the great pressure upon him and had tried to intervene, this contract would not be signed today. The American people are entitled to know this solemn conviction of mine and to honor this great President of ours who has shortened the strike by his wisdom.

"I would like to paste across the sky in eternal letters a warning to look out for these great lovers of America who want to do their loving out loud and who would capitalize the distress of our people for personal reasons."

#### Follows Hanna Tradition

Mr. Grant's successful mediation was in line with the traditions of the House of Hanna. The relations of that institution with labor always have been such that a Hanna man could command a real hearing from the union leaders. The founder of the firm was one of the first bituminous operators to hold out the hand of friendship to struggling organized labor more than a half century ago.

The late Senator Hanna also was a prominent figure in the anthracite controversies between the anthracite operators and the United Mine Workers in the early years of the presidency of John Mitchell. It was largely through his influence that the 1900 basis was continued until the big strike of 1902. And in 1922 Michael Gallagher labored to end the disastrous bituminous suspension of that year.

Major Inglis declined to make any

## Complete Text of the Agreement Signed at Philadelphia

This agreement, made this twelfth day of February, 1926, between Districts 1, 7 and 9, United Mine Workers of America, parties of the first part, and the anthracite operators, parties of the second part, covering wages and conditions of employment in the anthracite coal fields of Pennsylvania, witnesseth:

1—Work shall be resumed at once under the terms of the expired contract, which, subject to modification as hereinafter provided shall be in force and effect until Aug. 31, 1930.

2—At any time after Jan. 1, 1927, but not oftener than once in any year, either party may, in writing, propose modifications in the wage scales of said contract. The parties agree within fifteen days after receipt of such written proposals to start conferences in the usual manner in an effort to agree upon such modifications.

3—If within thirty days after starting such negotiations the parties have not agreed, all issues in controversy

shall be referred to a board of two men with full power and without reservation or restrictions, and the parties agree to abide by any decision or decisions of such board, either on the merits of the controversy or as to procedure to be followed. Such board shall be appointed as follows:

The operators shall name three men and the miners shall name three men. The operators shall select one man from the miners' list and the miners shall select one man from the operators' list, and the two men so approved shall constitute said board. Unless agreed, the men named by the parties shall not be connected with the United Mine Workers of America or the business of mining coal. The board shall be obligated, within ninety days after appointment, to arrive at a decision on all issues in controversy, and to that end shall formulate their own rules and methods of procedure and may enlarge the board to an odd number, in which event a majority vote shall be binding.

4—The demands of the operators and the mine workers on the question of co-operation and efficiency are referred to the Board of Conciliation, exclusive of the umpire, which shall work out a reciprocal program of co-operation and efficiency.

5—The Board of Conciliation shall proceed to equalize wages, etc., in accordance with Clause 12 of the agreement, dated Sept. 19, 1923.

6—Except as modified herein the terms and provisions of the award of the Anthracite Coal Strike Commission and subsequent agreements made in modification thereof or supplemental thereto, as well as the rulings and decisions of the Board of Conciliation, are hereby ratified, confirmed and continued during the term of this contract, ending Aug. 31, 1930.

In witness whereof, the parties hereto, through their accredited representatives, have caused this agreement to be properly executed, the day and year first above written:

On behalf of the anthracite operators:

W. W. INGLIS,  
GEORGE HADESTY,  
J. B. WARRINER,  
E. H. SUENDER,  
THOMAS THOMAS,  
ANDREW M. FINE.

On behalf of Districts 1, 7 and 9, United Mine Workers of America:

JOHN L. LEWIS,  
PHILIP MURRAY,  
THOMAS KENNEDY,  
C. J. GOLDEN,  
RINALDO CAPELLINI,  
ANDREW MATTEY.

Attest:

JAMES A. GORMAN, Secretary.

ALVAN MARKLE, Chairman.

comment upon the settlement before leaving Philadelphia. On his arrival at his home in Scranton, however, he issued the following statement:

"This time I am glad to return home with a contract that means the resumption of mining. The public's disappointment over earlier failures was not nearly so great as mine.

"I am confident that the agreement signed on Lincoln's Birthday will carry with it a long period of peace and prosperity. This prosperity will be shared not alone by the coal companies. If it is as good a peace as I think it is, the mine workers and every one in the region will benefit. No contract, in fact, that was not good for everybody would be worth signing.

"The past has shown that pulling in different directions gets us all into a lot of trouble. In place of that, what I should like to see established is a rule of co-operation and good feeling that includes the public, the mine workers and ourselves, all pulling together for the general good.

"That the industry which means so much to every one here has suffered severely is undeniable. With co-operation all round we can more quickly regain our markets and make this region again prosperous and happy.

"The thing that makes me most glad is that the strike is ended with honor to all concerned—all except the self-seekers who sought to make of it an opportunity to glorify themselves. They, of course, prolonged the strike. But to the earnest men who, without self-advertisement, sought to be really helpful in bringing about a settlement I am sincerely grateful."

#### Constructive Peace, Says Lewis

Mr. Lewis, in a statement issued soon after the signing of the agreement, said:

"The settlement is satisfactory and constructive. It assures stability and continuous operation for a five-year period, which is the longest agreement ever made in the coal industry.

"It does not contain the principle of arbitration, for which the operators have been contending, but it does provide machinery for the exercise of reason in the industry.

"The wage schedules of the expired contract are continued for five years unless changed by mutual consent of the representatives of both parties; both sides are thus given full protection.

"Under the agreement the Board of Conciliation is given broad powers as a stabilizing agency and is instructed to work out a reciprocal program of co-operation and efficiency which will restore a greater degree of confidence and harmony between the operators and the mine workers, which should result in substantial economies and reduced operating costs.

"Such a result will be a contribution to the industry which has been sadly needed, and if both parties work in good faith toward the attainment of the desired objective it will result in the industry being placed upon a higher plane that will command the respect of the coal-consuming public.

"It is the dawn of a new era in the anthracite industry, and both operators

## Strike Establishes Duration Record

The 1925-26 anthracite strike breaks all records for duration. Heretofore first place had been held by the 1902 suspension of 164 days, followed by the 1922 suspension of 163 days. On the day on which the agreement to end the 1925-26 strike was signed, the struggle was in its 165th day. About 150,000 workers (excluding maintenance men) were involved and the average loss in wages was over \$1,000,000 per day. The total cost of the strike, includ-

ing wages, profits and curtailed general business in the anthracite region may reach \$1,000,000,000.

The record of preceding strikes in the last twenty-five years follows:

1900: Sept. 12 to Oct. 29.

1902: May 12 to Oct. 23.

1906: April 1 to May 7.

1912: April 1 to May 20.

1920: The vacation strikes of varying length at different mines.

1922: April 1 to Sept. 11.

1923: Sept. 1 to Sept. 19.

and miners should make the most of the opportunity which is given them.

"The agreement has met with the unanimous approval of the members of the scale committee of Districts 1, 7 and 9, United Mine Workers of America, and I anticipate will be overwhelmingly indorsed when presented for ratification by the mine workers throughout the anthracite region.

"The high courage and unselfish devotion to public interest which has been demonstrated by the Hon. Gifford Pinchot, Governor of Pennsylvania, throughout the course of the strike deserves the commendation of the mine workers and all thoughtful citizens who have suffered inconvenience and paid exorbitant prices for substitute fuel.

"From the first Governor Pinchot, acting as a faithful public servant, has utilized the influence of his high office to crystallize public sentiment into an instrumentality that would end the strike.

"The present happy ending is in a large measure due to his untiring efforts to accomplish this result, and I am sure that his earnest spirit will receive ample reward in the gratification that comes from the knowledge that public necessity will now be relieved.

"The Federal Conciliation Service, under the personal direction of the Hon. James J. Davis, Secretary of Labor, has also rendered marked service in the controversy. The Secretary and his personal representatives have at all times exercised tact and wisdom in dealing with the problem and are justly deserving of credit."

#### Operators Are Gratiified

Later in the day, Mr. Warriner said:

"The operators are intensely gratified that the strike is at an end.

"If it has engendered any bitterness we hope it will soon pass away. We shall make the utmost effort to that end. The next step is to rebuild what the stoppage of production for five and a half months has torn down.

"Out of the strife and misunderstanding there has been obtained an assurance of five years of peace. During that time the public is guaranteed a regular, dependable supply of anthracite.

"Production will be resumed at the earliest possible date. With the re-

turn of the men this can be done quickly because our properties have been kept up throughout the strike and within a few days coal should be rolling to market.

"In a period of scarcity caused by the loss of some 35,000,000 tons of production it is inevitable that prices soar. The effects of such conditions have been plainly seen in the mounting prices of substitutes.

"So far as the recognized producers of anthracite are concerned, since the strike began they sold the stocks they had at the prices prevailing at the time of the strike. After production is resumed it is expected they will maintain normal Winter prices for domestic sizes. It is also expected that the retail trade will maintain normal margins, so that our customers may not suffer from profiteering."

## Congress Harps on Coal Despite Strike's End

By Paul Wooton

Washington Correspondent of Coal Age

Even though the anthracite strike has been settled Congress apparently is determined to devote some time to coal legislation. Chairman Parker, of the Committee of Foreign and Domestic Commerce of the House, has announced his intention to hold hearings on the recommendations of the Coal Commission. As this is written, no date has been fixed.

Senator Borah has announced his intention to urge coal legislation. The Oddie bill has been introduced in the House and active steps on behalf of this bill may be expected in the Senate.

When Secretary Hoover was asked about the charge, made on the floor of the Senate, that he had been delinquent in not having reported on the Oddie bill, he replied naively that the department could do little else if he had to write essays on each of the 5,000 bills introduced at each Congress which come within the purview of his department.

The District of Columbia Committee at last has brought about an arrangement whereby an audit of the books of certain retailers will be made by accountants from the office of the Comptroller General.



## Advisory Committee Report Made Public; Reynders Out of Range of Protests

The report of the Bureau of Mines Advisory Committee, of which J. V. W. Reynders is chairman, was made public Feb. 18 at the Department of Commerce, in Washington, D. C. Secretary Hoover is withholding comment until he has had an opportunity to study the report in detail.

The report, which was submitted to Secretary Hoover on Jan. 5, contains the following recommendations:

"Transfer to the Bureau of Mines of the Division of Mineral Resources, which as a part of the Geological Survey has long maintained an important statistical service for the mineral industries, and placing the whole in the Department of Commerce, where the economics of industry and trade are under constant review, affords an excellent opportunity for developing the further usefulness of the Bureau of Mines in an important direction. It will not be satisfactory to attempt to segregate economic studies entirely from the technologic and engineering aspects of these industries. Economic policy relating to minerals must be based on a wide knowledge of technical and engineering facts, and, conversely, the direction and intensity of technical studies must be related to the economic situation in the industry.

### Recommends New Branch

"Your committee believes that the interests of the several mining industries concerned can be best served by the Department of Commerce by a consolidation of relationships within the Bureau of Mines and therefore recommends the incorporation of a branch of industry or economics within the Bureau of Mines and the transfer to the Bureau of the Coal, Minerals and Petroleum divisions' work of the Bureau of Foreign and Domestic Commerce, with any others involved, to the extent that the officials of the department may deem it wise or necessary for the accomplishment of this purpose.

"Because of the limitations placed upon federal safety service by our dual form of government, the object of the Safety Division should be the development of a public opinion within the various states for the creation of such standards of mine inspection and accident prevention and of such adequate facilities as will enable this Bureau to turn over gradually to the individual states the work which properly belongs to them, in the meantime maintaining a high standard in its personnel and continuing unfalteringly its missionary endeavor toward the prevention of accidents, its encouragement of an increasingly higher standard of safety, and the actual rescue work in cases of emergency.

"It is recommended that the work of the small stations be consolidated into three units, located at Pittsburgh, Salt Lake City, and one at a point where the oil industry could be well served. Three stations so situated could be built up into efficient units where brains and apparatus could be consolidated under more efficient leadership and super-

## Caught in Coal Slide, Turns Up Safe in Tender

A sudden slide of coal in a big bin of the Louisville & Nashville R.R. at Lebanon Junction, Ky., last week came near being disastrous to W. Metcalf. Mr. Metcalf and other employees of the L. & N. were engaged in digging coal down when the slide occurred. Seeing Mr. Metcalf's perilous position, his companions ordered an engine under the slide, and as the coal was released, filled the tender.

Mr. Metcalf was forced through the chute, carrying down with him several tons of coal.

vision than is possible with many small struggling units.

"The Bureau of Mines . . . depends on the co-operation and good will of the industries in collecting data. It is most important that this good will be not lost and that the confidential character of individual returns be respected in the fullest degree. Accordingly, it is recommended that neither the Bureau nor the members of its staff be used in connection with prosecutions by the government or the states, for infraction of laws, or in determining damages in civil suits.

"It is recommended that the collection of statistics be transferred to the proposed economic branch of the Bureau and that the method of collection and form of publication of these statistics be carefully revised to make these figures more accurate and in consequence of greater value to the industry.

"We believe that, subject to the limitations imposed by appropriations available for this work, the Bureau should collect current figures showing production, sales, distribution, stocks and consumption, also costs, selling prices, realizations, etc., if desired by the industry concerned, and that such information should be tabulated and promptly distributed to all interested parties.

### Seeks Advice and Criticism

"The point of view of the Bureau staff, essentially that of a field engineer, has led to a feeling that the work was not complete until the results had been put into practice. Such a result is greatly facilitated through co-operative agreements at the same time that a proper part of the expense is assessed to those first and more immediately benefited. . . . It is highly desirable that the staff of the Bureau have at all times the advice and criticism of the industry, and the system of advisory committees already in being may, we think, be extended to advantage to cover the initiation of various studies, the methods of their conduct, and the partial and final results."

It is recognized in Washington that the report is certain to arouse many protests. Some are wondering if Chairman Reynders chose this time to make his trip to Soviet Georgia so as to be beyond reach when the report was made public.

## Lawton Guilty of Contempt; Sentence Withheld

Tyler G. Lawton, of Terre Haute, Ind., president of District No. 11, United Mine Workers, was found guilty of contempt of court by Judge Edgar S. Durre, of the Superior Court of Vanderburgh County, as a result of an order issued by Lawton, giving miners working in the Green Mound Coal Co. mine at Washington, Ind., the alternative of quitting work at their present scale or losing their membership in the United Mine Workers. The order was part of a unionization movement under way in the southern part of the Indiana field.

The mine was operating under a receivership by order of Judge Durre's court and it was held that Lawton's order interfered with the discharge of his duties by the receiver. Lawton pled ignorance of the receivership.

Judge Durre withheld sentence until May 1 with the advice that Lawton attempt to get the men to return to work. However, the miners were not working under the Terre Haute agreement and if the district president orders them to return to work, he will be violating his obligations to the union. If he does not order them to return to work, he faces the probability of invoking a sentence from the court. The maximum penalty on this charge is a fine of \$100 and 90 days in jail.

## 1 Dead, 19 Hurt, 600 Escape In Ohio Mine Blast

An explosion at about 8 a.m. Feb. 15 in the Powhatan Mine, 16 miles south of Bellaire, Ohio, caused the death of one miner and injuries to nineteen others, one of whom may die. Six hundred other miners escaped without injury. The men escaped through the main airshaft, located 300 ft. from the scene of the explosion. The airshaft was undamaged, though the interior of the main shaft was wrecked. The cause of the blast is not known. It is believed that the mine will be cleaned up so that operations can be resumed within a few days.

The mine is owned by the Powhatan Mining Co., which recently figured in a merger with the North American Coal Corp., of which Frank E. Taplin is president.

### Defers Filling Read's Place

No successor to T. T. Read will be named at this time, it is stated by Director Turner of the Bureau of Mines. Mr. Read, who was in immediate charge of the Bureau's safety work, recently resigned to undertake a membership drive for the American Institute of Mining and Metallurgical Engineers.

As some reorganization of the safety work is in prospect, Director Turner in the meantime expects to give considerable personal attention to that branch of the work. With the assistance of those within the Bureau who are familiar with the Bureau's safety activities, the work will be looked after carefully while the reorganization studies are in progress.

### Kernohan Named Manager Of Houston Coal Co.

W. R. Kernohan, of Chicago, is the new general manager of the Houston Coal Co., having taken charge on Feb. 15, with headquarters in Cincinnati, Ohio. Since the death of Kuper Hood, about two years ago, the position was held for short periods by Harry Olmstead, who died suddenly from pneumonia, and by Leo Lewellyn, who returned to a washery manufacturing company with which he had formerly been connected. Mr. Kernohan, who is 46 years old, has spent his entire business life in the coal trade, having been associated at various times with S. P. Kineon, the Kanawha Fuel Co., the Carbon Fuel Co., the Zeigler Coal Co. (in full charge of sales), the Pocahontas Coal Sales Co. and the M. A. Hanna Co. In 1924, with George M. Cain, he organized the Kernohan Coal Co., of Chicago, and this company will continue to do business under its present name, but on an independent basis.

### Scale of 1922 for Two Years In Nova Scotia

The convention of District No. 26, United Mine Workers, held at Sydney, N. S., during the week ending Jan. 30, adopted by a vote of 57 to 38 the report of the Royal Commission as a basis for negotiations with the operators for the establishment of a new wage schedule. The report recommends a long-term contract at the wages of 1922, which in some cases are rather below those fixed by the last contract in 1925.

The basis recommended by the report is a minimum wage, and a sliding scale, with the establishment of an accounting system giving the accountants of the union access to the company's books to ascertain what share the men may demand in the profits as wage increase.

It was agreed that the policy of the district shall be directed toward the nationalization of the mines with compensation to the owners to the extent of the value of their operating plants and equipment. A contract running until 1928 is favored.

### To Extend Co-operative Study of Explosions

Co-operative research on coal-mine explosions by the governments of Great Britain and of the United States has been so successful that plans are being made for its extension to the field of metallurgy. The coal work also may be enlarged so as to include research on fuels.

Dorsey A. Lyon, assistant director of the Bureau of Mines, in charge of its research branch, and George S. Rice, the Bureau's chief mining engineer, will go to London in the spring to discuss the matter with the British authorities.

The work, if undertaken, will be confined to fundamental research. By working together duplication of effort can be avoided and plans made so that more can be accomplished than would be the case were the work conducted independently.

In addition to the exchange of information as to the progress of work on mine-explosion problems, Dr. H. F. Coward, a British specialist, is working at the Pittsburgh station of the Bureau of Mines with the group engaged in this study. In the same way Dr. Reinhardt Thiessen, of the Bureau of Mines staff, is working in the British laboratory at Eskmeals.

### Rocky Mountain Institute Plans Live Meeting

The program for next week's meeting of the Rocky Mountain Coal Mining Institute, in Denver, Colo., includes a paper by Dan Harrington, of Salt Lake City, Utah, on electrical dangers in coal mines. This already has elicited several hot replies from manufacturing companies, all of which will be read at the meetings, which run through Feb. 23, 24 and 25. G. A. Murphy, of Storrs, Utah, will read a paper on spiralizing coal; Edward Bottomley, of Kleenburn, Wyo., will describe the loader operations in his properties; E. C. Horne has a paper on ventilation; Jack King is to display moving pictures telling the story of wire rope, and George B. Pryde, of Rock Springs, Wyo., has the completed report of the safety committee ready to offer.

### National Council to Study Spanish Fuel Problem

A national council of combustibles (fuels) recently was authorized in Spain by a royal decree to study and propose to the government the proper procedure for the solution of the national fuel problem—production, distribution and consumption—according to a report by Commercial Attaché Charles H. Cunningham, Madrid, to the Department of Commerce.

The commission is to consist of 25 members, 13 to be appointed from the government departments most concerned with the fuel problem and others representing the department of mines, the Consejo de Economía Nacional, the army and navy and the ministries of commerce, labor, finance and public works. The commission is to have jurisdiction over coal and petroleum problems and in addition to handle questions of the commercial classification of coal, its transportation, distribution, floating and free deposits. It is also to have jurisdiction over taxes, customs, duties, and financial problems concerned with coal production, including subsidies by the state, loans to the coal industry, and labor problems such as the regulation of salaries and the solution of labor disputes.

### Spurr Nominated Chairman New York Group A.I.M.E.

Ballots are being circulated for the election of the New York Section of the American Institute of Mining and Metallurgical Engineers. The ballots must be received on or before Feb. 25 to be counted in the election. J. E. Spurr, editor, *Engineering & Mining Journal-Press*, is nominated for chairman. Nominees for vice-chairman are Sidney Rolle and A. D. Brokaw, and for committeemen M. F. Chase and Karl Hoffman. M. H. Merriss is nominated for treasurer. Two vice-chairmen and two committeemen are to be elected.

## Coal Produced in Kansas, Maryland and Michigan in 1924<sup>a</sup>

(Exclusive of Product of Wagon Mines)

State and County	Net Tons			Value		Number of Employees				Average Number of Days Worked	Average Tons Per Man Per Day
	Loaded at Mines for Shipment	Sold to Local Trade and Used by Employees	Used at Mines for Steam and Heat	Total Quantity	Total Average Per Ton	Underground	All Others	Surface	Total		
<b>Kansas</b>											
Cherokee.....	729,718	80,765	16,735	827,218	\$2,257,000 \$2.73	683	119	320	1,122	150	4.93
Crawford.....	3,013,345	160,335	49,069	3,222,749	9,830,000 3.05	4,730	965	729	6,424	149	3.37
Leavenworth and Osage.....	104,501	65,219	998	170,718	687,000 4.02	683	146	60	889	174	1.10
Linn.....	23,561	3,487	.....	27,048	80,000 2.96	86	20	20	126	94	2.28
<b>Total.....</b>	<b>3,871,125</b>	<b>309,806</b>	<b>66,802</b>	<b>4,247,733</b>	<b>\$12,854,000 \$3.03</b>	<b>6,182</b>	<b>1,250</b>	<b>1,129</b>	<b>8,561</b>	<b>151</b>	<b>3.29</b>
<b>Maryland</b>											
Allegany.....	1,304,452	157,214	8,200	1,469,866	\$3,522,000 \$2.40	1,818	639	401	2,858	169	3.04
Garrett.....	640,807	14,711	8,319	663,837	1,107,000 1.67	555	217	146	918	185	3.90
<b>Total.....</b>	<b>1,945,259</b>	<b>171,925</b>	<b>16,519</b>	<b>2,133,703</b>	<b>\$4,629,000 \$2.17</b>	<b>2,373</b>	<b>856</b>	<b>547</b>	<b>3,776</b>	<b>173</b>	<b>3.27</b>
<b>Michigan</b>											
Bay.....	243,218	3,833	11,692	258,743	\$1,159,000 \$4.48	460	199	74	733	139	2.53
Saginaw.....	524,141	2,600	45,536	572,277	2,443,000 4.27	556	191	71	818	212	3.30
<b>Total.....</b>	<b>767,359</b>	<b>6,433</b>	<b>57,228</b>	<b>831,020</b>	<b>\$3,602,000 \$4.33</b>	<b>1,016</b>	<b>390</b>	<b>145</b>	<b>1,551</b>	<b>178</b>	<b>3.00</b>

(a) Note that the coal statistics of the Geological Survey for a given year include only the mines that had an output in that year. Many mines that operated in 1923 produced no coal in 1924; moreover, many of the mines that did produce in 1924 worked for a short time only. The number of active mines of commercial size in Kansas was 222 in 1923 and 228 in 1924; in Maryland, 105 in 1923 and 93 in 1924; in Michigan, 13 in 1923 and 9 in 1924.

(b) Includes also loaders and shotfired.

Statistics issued by U. S. Bureau of Mines.

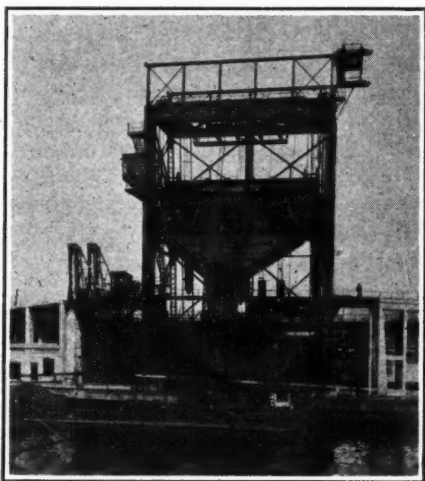


## Philadelphia Has World's Largest Coal Dumper

An important addition to the facilities of the Reading Company's 3,800-mile railway system at Port Richmond, its Philadelphia Harbor terminal, was made during the past year with the installation of the world's largest coal-car dumper. This piece of machinery is capable of handling 40 100-ton coal cars each hour, is to a great extent electrically operated, and all control apparatus is electrically actuated.

The huge new dumper loads freighters with export coal, barges for coastwise trade, and smaller craft for direct delivery to the industries of the Port of Philadelphia.

Cars to be dumped are pulled up a 12 per cent grade onto the dumper cradle, and are hoisted vertically to the hopper. The main operator, stationed in a cab near the top of the machine, which gives him a clear view of the car as well as the ship into which it is to be emptied, controls the raising of the car as well as the height of the pan into which the coal is to be



Reading Co.'s Coal Dumper at Philadelphia

dumped. The hoisting machinery is operated by steam, while the pan is governed by a 150-hp. Westinghouse electric motor.

At the end of the pan into which the coal is dumped there is a telescopic chute, with an operator to control its movement stationed in a cab directly over the ship's hatch, so that proper direction of the flow of coal can be obtained. The entire operation is controlled electrically and with surprising flexibility, which assures even distribution of the coal. The pan and telescope mechanism is hoisted clear of receiving ships before and after docking by a 275-hp. motor, protected with limit relays and full magnetic dynamic breaking controller.

In connection with the car hoist, a large thawing house for use in winter is maintained on the dock. A temperature of 200 deg. F. is maintained in extreme weather, which quickly thaws the coal for dumping into waiting barges or ships. Four tracks pass through the building, having a total capacity of 48 cars.



© Keystone View Co.

Lord Londonderry

British political and industrial circles were much interested in the statement last week by this eminent operator that "there need be no lowering of wages and no lengthened hours in the pits" and his previous statement at Seaham that the coal owners do not believe that the prosperity of the industry depends upon the reducing of the wages or lengthening of hours.

## N. Y. Coal Exports Decline

During the twelve months ended Dec. 31, 1925, shipments of fuel to foreign countries through the Port of New York included 71,533 tons of anthracite, 14,028 tons of bituminous coal and 5,140 tons of coke, as compared with 98,645 tons of anthracite, 29,941 tons of bituminous and 25,334 tons of coke during the preceding year.

Of this tonnage Canada in 1925 received 62,683 tons of anthracite and 5,108 tons of bituminous coal as compared with 84,668 tons of anthracite and 1,409 tons of bituminous in 1924.

The average price per ton for the anthracite exported in 1925 was \$11.17, while in 1924 it was \$11.45. Bituminous coal brought \$7.44 per ton last year as compared with \$6.86 in 1924 and coke \$17.04 per ton in 1925 as compared with \$12.11 the preceding year.

## Coal Company to Make Own Liquid Oxygen Explosive

Erection of a plant for the manufacture of liquid oxygen has been started by the Enos Coal Mining Co., which operates the largest stripping mine in the United States, near Oakland City, Ind. The liquid oxygen will be used in the manufacture of an explosive which will be used by the company in its own workings and which will also be placed on the market commercially. Cartridges of cheesecloth filled with lamp black will be soaked in the liquid oxygen and then allowed to dry to form the explosive, it is said. It is fired by the use of the ordinary dynamite cap and electric battery.

## Mail Order Coal Company In Financial Straits

The Boylston Co., Chicago's well known mail order coal house, has become insolvent, a recent meeting of the company's creditors revealed. The concern is believed to owe about \$185,000, the creditors including approximately 100 country banks and a number of coal companies. The Franklin County Mining Co., it is said, has a claim for \$80,000. Plans are being studied whereby creditors may realize on the available assets.

The officers of the Boylston Co. are Simon Levy, president and treasurer; Arthur Levy, vice-president, and Charles B. Levy, secretary and general manager. The Boylston Co. was organized in April, 1922, and owned and operated the Popular Coal Co., the Washington Coal Co., the Faultless Fuel Co. and the Red Seal Coal Co.

## C. & O. Plans Connection With Virginian Ry.

Unconfirmed reports are in circulation in southern West Virginia to the effect that the Chesapeake & Ohio Ry. proposes to take over the railroad interests of the Glade Creek Coal & Lumber Co., of Raleigh County, and construct a line through the Richmond, Flat Top and Camp Creek districts, connecting with the Virginian Ry. at Kegley, near Princeton, on condition that the Chesapeake & Ohio be merged with the Virginian.

The Glade Creek Coal & Lumber Co. has built a line from the main line of the Chesapeake & Ohio, about ten miles east of Prince, through Raleigh County for a number of miles to its extensive holdings and a large bridge has been built over the New River at one point near the C. & O. Coal companies owning property near the rumored extension include the New River Co., Flat Top Mining Co., the Prince heirs, Raleigh Lumber Co., Rolfe Coal Mining Co. and the Camp Creek Coal & Lumber Co.

## Use of Permissibles Gains

A total of 58,380,217 lb. of permissible explosives was consumed in the United States in 1925, an increase of about 6 per cent as compared with 1924, according to a preliminary report by the Bureau of Mines. Ninety per cent of the total amount sold in 1925 was for use in coal mining.

Sales of black blasting powder during 1925 were approximately 6,307,184 kegs of 25 lb. each, a decrease of 6 per cent in comparison with 1924. Of the total reported sales of black powder during 1925 coal mines used 84 per cent.

Sales of other high explosives in 1925 totaled approximately 285,295,097 lb., an increase of 4 per cent. Of the total amount used, 10 per cent was for coal mining.

Plants manufacturing permissibles and other high explosives operated in 1925 at the rate of 62 per cent of capacity, which is the same rate as prevailed in 1924.





## Middle Western Prices Break

Plans to keep Middle Western prices stabilized came a cropper in the Chicago market last week. Saline County was the first to break with a reduction of 25c. from the \$3.50 basis on 6-in. lump. Franklin County met this challenge by cutting to \$3. Neither action brought any influx of orders and there was some resentment in the retail trade, which had been assured that the \$3.50 price would be maintained throughout the month. Cartersville also is weaker.

Southern Illinois, however, feels that the reductions place that field in a better position to withstand the inroads of non-union coal from Kentucky and West Virginia. Some high-grade 4-in. block from the last-named state has been offered as low as \$2 and there is 6-in. Kentucky coal which can be bought by wholesalers for \$2.25. Even smokeless mine-run is down to \$2@2.25 and good lump from the low-volatile districts is available at \$4.25@4.75.

Smokeless nut and egg, on the other hand, are scarce and prices are stiff.

The slump in domestic demand, of course, has curtailed the output of fine coal from the Illinois and Indiana fields. Nevertheless the steam market still drags. Purchasing agents are drawing upon storage piles and ignore solicitation except at bargain-counter prices.

Duquoin and Jackson County have not been behind the southern Illinois field in the matter of price-cutting. Reductions have put quotations 25@35c. under the ruling figures in the Cartersville district. Neither the Mt. Olive nor the Standard field is immune from the general monotony. Mines in those districts are averaging three days a week.

Domestic business in the St. Louis local market is only fair, with the cheaper coals moving better than higher priced Illinois tonnage. Steam trade is featureless. Country domestic and steam demand is quiet.

## Kentucky Fights Steam Coal Slump

Kentucky operators are trying to check the slump in steam-coal prices, but neither the curtailment in production brought about by an easier domestic demand nor the refusal on the part of some shippers to flood the market with consignment coal has been wholly effective. The better grades of Kentucky screenings, both eastern and western, are selling at 60@95c. Lower grades and distress tonnage have been sold down to 15@20c.

This weakness has been reflected in prices on wagon-mine mine-run. Some coal from those operations has been offered as low as 90c. Steam buyers are taking full advantage of the situation, apparently content to let the future take care of itself.

Although some shippers are asking \$3.25 for choice eastern Kentucky block, the general run of prices is \$2.50@3. Lump and egg bring \$2@2.25, and mine-run, \$1.35@1.75. Western Kentucky block is quoted at \$1.85@2.15;

## Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern				Midwest			
	Market Quoted	Feb. 16 1925	Feb. 1 1926		Market Quoted	Feb. 16 1925	Feb. 1 1926
Smokeless lump.....	Columbus....	\$3.85	\$4.35	Franklin, Ill. lump.....	Chicago.....	\$3.10	\$3.50
Smokeless mine run.....	Columbus....	1.90	2.85	Franklin, Ill. mine run....	Chicago.....	2.35	2.50
Smokeless screenings.....	Columbus....	1.20	1.60	Franklin, Ill. screenings....	Chicago.....	1.85	1.60
Smokeless lump.....	Chicago....	3.60	4.35	Central, Ill. lump.....	Chicago.....	2.85	3.10
Smokeless mine run.....	Chicago....	1.60	2.35	Central, Ill. mine run....	Chicago.....	2.20	2.30
Smokeless lump.....	Cincinnati..	3.85	4.10	Central, Ill. screenings....	Chicago.....	1.75	1.25
Smokeless mine run.....	Cincinnati..	1.85	2.50	Ind. 4th Vein lump.....	Chicago.....	2.85	3.00
Smokeless screenings.....	Cincinnati..	1.35	1.35	Ind. 4th Vein mine run....	Chicago.....	2.35	2.30
Smokeless mine run.....	Boston.....	4.45	4.85	Ind. 4th Vein screenings....	Chicago.....	1.70	1.70
Clearfield mine run.....	Boston.....	1.95	2.05	Ind. 5th Vein lump.....	Chicago.....	2.50	2.55
Cambria mine run.....	Boston.....	2.30	2.40	Ind. 5th Vein mine run....	Chicago.....	2.10	1.95
Somersett mine run.....	Boston.....	2.10	2.20	Ind. 5th Vein screenings....	Chicago.....	1.45	1.25
Pool 1 (Navy Standard)...	New York....	2.70	3.05	Mt. Olive lump.....	St. Louis....	2.85	2.85
Pool 1 (Navy Standard)...	Philadelphia..	2.80	2.95	Mt. Olive mine run....	St. Louis....	2.35	2.00
Pool 1 (Navy Standard)...	Baltimore....	2.25	2.30	Mt. Olive screenings....	St. Louis....	1.50	1.75
Pool 9 (Super. Low Vol.)...	New York....	2.05	2.55	Standard lump.....	St. Louis....	2.35	2.45
Pool 9 (Super. Low Vol.)...	Philadelphia..	2.20	2.60	Standard mine run....	St. Louis....	1.80	1.80
Pool 9 (Super. Low Vol.)...	Baltimore....	1.85	2.15	Standard screenings....	St. Louis....	1.25	1.05
Pool 10 (H.Gr. Low Vol.)...	New York....	1.75	2.25	West Ky. block.....	Louisville..	2.25	2.00
Pool 10 (H.Gr. Low Vol.)...	Philadelphia..	1.85	2.35	West Ky. mine run....	Louisville..	1.35	1.35
Pool 10 (H.Gr. Low Vol.)...	Baltimore....	1.70	1.95	West Ky. screenings....	Louisville..	.90	.90
Pool 11 (Low Vol.).....	New York....	1.55	2.10	West Ky. block.....	Chicago.....	2.35	2.35
Pool 11 (Low Vol.).....	Philadelphia..	1.65	2.10	West Ky. mine run....	Chicago.....	1.35	1.50
Pool 11 (Low Vol.).....	Baltimore....	1.50	1.70				
High-Volatile, Eastern				South and Southwest			
Pool 54-64 (Gas and St.)...	New York....	1.50	1.60	Big Seam lump.....	Birmingham..	2.85	2.75
Pool 54-64 (Gas and St.)...	Philadelphia..	1.50	1.60	Big Seam mine run....	Birmingham..	1.75	2.10
Pool 54-64 (Gas and St.)...	Baltimore....	1.65	1.65	Big Seam (washed).....	Birmingham..	1.75	2.30
Pittsburgh sc'd gas.....	Pittsburgh....	2.50	2.65	S. E. Ky. block.....	Chicago.....	2.75	2.85
Pittsburgh gas mine run....	Pittsburgh....	2.25	2.10	S. E. Ky. mine run....	Chicago.....	1.50	1.85
Pittsburgh mine run (St.)...	Pittsburgh....	1.95	2.05	S. E. Ky. block.....	Louisville..	2.35	2.75
Pittsburgh slack (Gas)....	Pittsburgh....	1.30	1.25	S. E. Ky. mine run....	Louisville..	1.35	1.55
Kanawha lump.....	Columbus....	2.50	2.25	S. E. Ky. screenings....	Louisville..	.75	1.00
Kanawha mine run.....	Columbus....	1.60	1.70	S. E. Ky. block.....	Cincinnati..	2.50	3.00
Kanawha screenings.....	Columbus....	.75	.65	S. E. Ky. mine run....	Cincinnati..	1.40	1.50
W. Va. lump.....	Cincinnati..	2.05	2.75	S. E. Ky. screenings....	Cincinnati..	.85	.80
W. Va. gas mine run....	Cincinnati..	1.40	1.50	Kansas lump.....	Kansas City..	4.85	5.00
W. Va. steam mine run....	Cincinnati..	1.30	1.35	Kansas mine run....	Kansas City..	3.35	3.10
W. Va. screenings.....	Cincinnati..	.75	.80	Kansas screenings....	Kansas City..	2.50	2.30
Hooking lump.....	Columbus....	2.50	2.45				
Hooking mine run.....	Columbus....	1.60	1.75				
Hooking screenings.....	Columbus....	1.10	1.15				
Pitts. No. 8 lump.....	Cleveland....	2.30	2.30				
Pitts. No. 8 mine run....	Cleveland....	1.85	1.80				
Pitts. No. 8 screenings....	Cleveland....	1.30	1.15				

## Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

		Feb. 16, 1925		Feb. 8, 1926		Feb. 15, 1926	
	Market Quoted	Independent	Company	Independent	Company	Independent	Company
Broken.....	New York....	\$2.34			\$8.00@9.25		
Broken.....	Philadelphia..	2.39			9.15		
Egg.....	New York....	2.34	\$8.50@9.25		8.75@9.25		
Egg.....	Philadelphia..	2.39	9.45@9.75		8.80@9.25		
Egg.....	Chicago.....	5.06	8.17@8.40		8.08		
Stove.....	New York....	2.34	9.25@10.00		9.00@9.50		
Stove.....	Philadelphia..	2.39	10.10@10.75		9.15@9.50		
Stove.....	Chicago.....	5.06	8.80@9.00		8.53@8.65		
Chestnut.....	New York....	2.34	9.50@10.25		8.75@9.40		
Chestnut.....	Philadelphia..	2.39	10.00@10.75		9.25@9.40		
Chestnut.....	Chicago.....	5.06	8.61@9.00		8.40@8.41		
Pea.....	New York....	2.22	4.50@5.50		5.50@6.00		
Pea.....	Philadelphia..	2.14	5.75@6.00		6.00		
Pea.....	Chicago.....	4.79	5.36@5.75		5.36@5.95		
Buckwheat No. 1.....	New York....	2.22	2.25@2.85		3.00@3.15		
Buckwheat No. 1.....	Philadelphia..	2.14	2.50@3.00		3.00		
Rice.....	New York....	2.22	1.90@2.25		2.00@2.25		
Rice.....	Philadelphia..	2.14	2.00@2.25		2.25		
Barley.....	New York....	2.22	1.40@1.65		1.50		
Barley.....	Philadelphia..	2.14	1.50		1.50		
Birdseye.....	New York....	2.22	1.40@1.65		1.60		

\*Net tons, f.o.b. mines.

Due to suspension of mining in hard-coal fields and practical stoppage of shipments, quotations are only nominal and are not printed. Coal Age quotations on anthracite will be resumed next week.

lump and egg, \$1.60@\$2, and mine-run, \$1.25@\$1.50, with little desirable tonnage under the lower figure.

#### Dock Shipments Decline

The weather has taken its toll of the domestic business of the docks at the Head of the Lakes this month. The industrial outlook, however, is encouraging. Iron and steel plants are taking larger tonnages than a year ago. Mining companies on the Minnesota iron ranges also are in the market for more coal. Dock quotations are unchanged.

Coal shipments from the Duluth-Superior docks last month, according to the Western Railway Weighing & Inspection Bureau, totaled 23,990 cars, as compared with 25,735 cars in December and 27,693 cars in January, 1925. Supplies of bituminous coal on the commercial docks on Feb. 1 approximated 3,600,000 tons. Operators hope that the carry-over can be materially reduced before the opening of navigation.

Outside of a slight decrease in business due to milder weather conditions, the Milwaukee situation is unchanged. Domestic demand has been well taken care of with coke, smokeless coal and high-grade bituminous so that former anthracite consumers have had no cause for complaint. During January, Milwaukee received 10,327 tons of anthracite and 36,741 tons of bituminous coal via car ferry and 4,450 tons of anthracite and 46,163 tons of bituminous via all-rail routes.

#### Southwestern Outlook Drab

The "no-bill" report of Feb. 10 showed 399 unbilled loads at the Kansas mines. Of this number, 190 cars were lump, 40 were nut and 169 were screenings. The accumulation of fine coal, however, is causing little worry, as operators feel that the falling off in domestic demand will soon correct that situation. In an effort to clean up lump tonnage, many producers have cut their price to \$4.50 and some will take orders at \$4.25.

The Arkansas outlook is even more depressing. The late winter demand was below normal. All mines have been checking up idle time and some have closed down completely.

Mild weather throughout Nebraska and Kansas has cut down shipments of domestic coal from the Colorado mines. Production is slowing up, but prices are unchanged. Last week there were approximately 500 unbilled loads in the southern Colorado field.

The bottom has dropped out of the market for domestic coal in Salt Lake City territory. Steam demand, however, continues normal for the season of the year. No new contracts have been signed, but early activity in that direction is expected. The weak domestic demand threatens to create a shortage of slack in Utah.

#### Cancellations Burn Cincinnati Wires

The Cincinnati market was not left long in doubt as to the effect the settlement of the anthracite strike was to have. Friday afternoon (Feb. 12) messenger boys wore a steady path to low-volatile offices with telegrams canceling or suspending orders. Coming on top of a weaker market for high-volatile

coals, smokeless producers immediately decided that the better part of merchandising was discretion. Plans already are in the making for a renewed drive on western trade. What further steps will be taken in the eastern sales campaign is a question of the future.

At the present time the market is glutted with low-priced fuel. Slack at 40@60c. is common. Some Hazard shippers are offering block at reductions which have not been approached in months—and other districts threaten to meet these price cutters on their own ground. Harlan prices, too, are slipping. Logan County quotations also are on a low basis.

The principal worry is what to do with coal already on wheels. The latest interchange report of the American Railway Association shows 13,353 cars passing through the Cincinnati gateways—an increase of 1,873 cars over the preceding week. Louisville & Nashville loads were 1,174 cars heavier and Chesapeake & Ohio movement increased 677 cars.

Retail business in the Cincinnati district has been helped by wintry weather. Prices to the consumer are unchanged, but an early revision is in prospect.

#### Cold Wave Helps Central Ohio

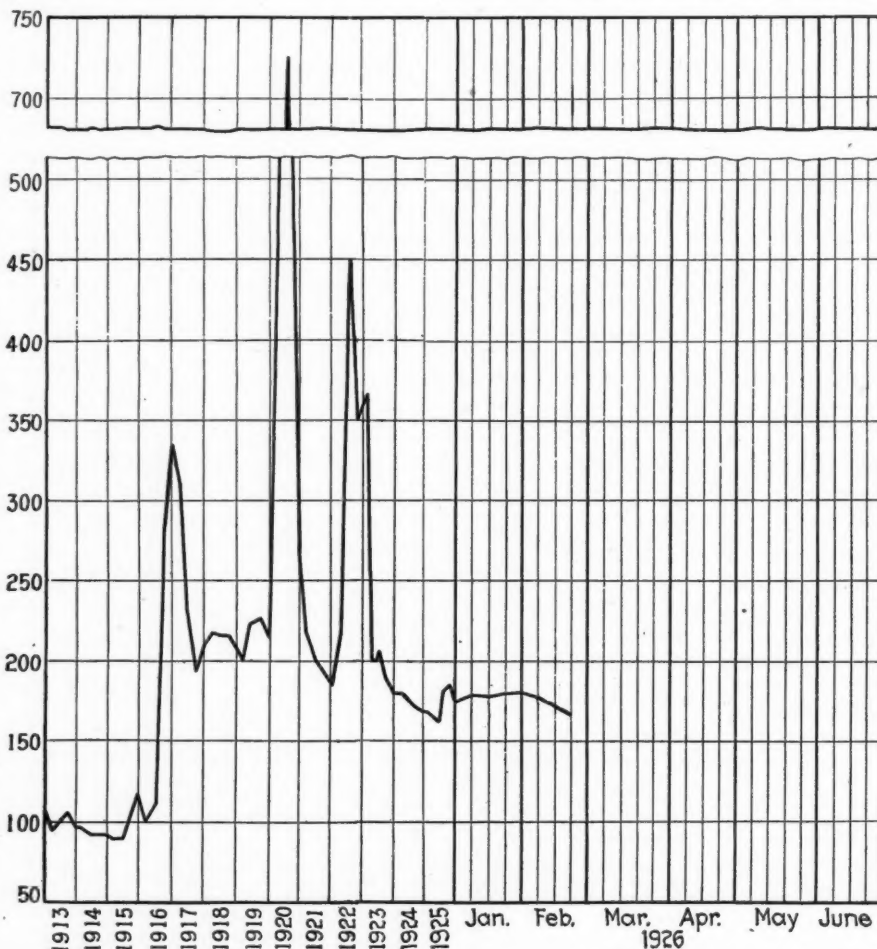
A cold wave last week quickened domestic demand in central Ohio and somewhat toned up a flabby market. The fact that many retailers are still carrying liberal stocks, however, robbed the situation of real intensity. Demand favors the smokeless coals; splints and Kentucky block are a close second, but Ohio coals make a poor third. Consumer buying is in small lots.

There is no animation in steam-coal trading. Shipments of West Virginia slack at 50@75c. keep prices on Ohio screenings close to the dollar mark. Many large industries are stocked up for 60 to 90 days. The steadiest buyers are the utilities and the steel plants. Railroad consumption has tapered off since the close of navigation. There is some distress tonnage, but not enough to embarrass the market.

Output from the southern Ohio field as a whole does not exceed 20 per cent of capacity. Pomeroy Bend is doing much better than Hocking Valley and other southern districts.

#### Distress Coal Crowds Cleveland

Distress coal depressed the Cleveland market last week. Slack and nut-and-slack were quoted down to \$1 and con-

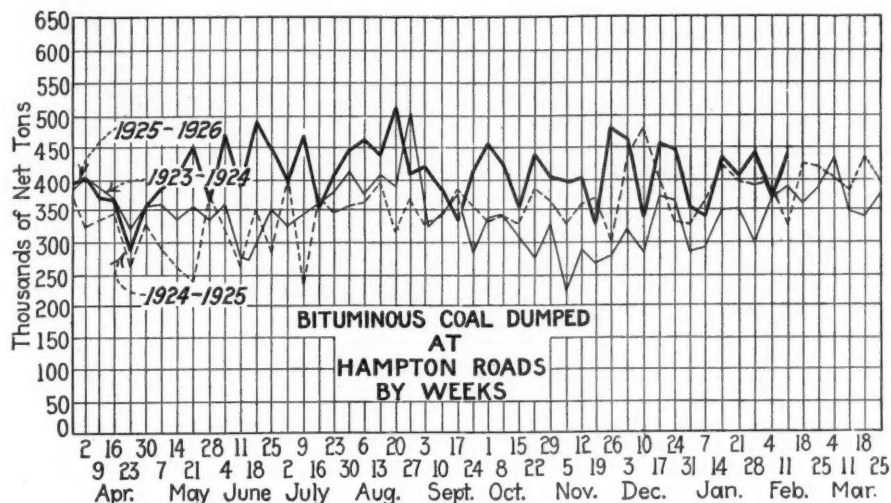


Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines

	1926	1925	1924
Feb. 15	173	178	178
Feb. 8	177	178	168
Feb. 1	178	168	186
Jan. 25	178	168	186
Feb. 16	178	168	186
Feb. 18	178	168	186
Weighted average price	\$2.10	\$2.14	\$2.16
	\$2.16	\$2.16	\$2.04
			\$2.25

This diagram shows the relative, not the actual, prices on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportions each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.





cessions were offered from list prices also on other grades of eastern Ohio coals for steam consumption. The retail trade, on the other hand, has been reasonably active because of cold weather, but this demand has been centered upon West Virginia smokeless, not Ohio coals.

During the week ended Feb. 6 the No. 8 field produced 296,000 tons, or approximately 42 per cent of potential capacity. This was an increase of 37,000 tons over the preceding week and 1,000 tons more than a year ago.

#### Gloom Still Shrouds Pittsburgh

Aside from the steady eastern demand for nut and egg coal at \$2.75@ \$3.25, there is no life to the Pittsburgh market. The outlook for the future is dark. Presumably the demand from the East will disappear as soon as the anthracite mines go into operation and the competition of non-union coals in Pittsburgh's normal markets will increase. Moreover, at the present time there seems little disposition to follow the lead of the Pittsburgh Coal Co. in reverting to the 1917 wage scale.

Central Pennsylvania also foresees dark days ahead with the end of the anthracite strike. Output the past week was hampered by the heavy snows and resultant railroad congestion. Pool 1 coal is quoted at \$3.35@ \$3.80; pool 71, \$3.10@ \$3.55; pool 9, \$2.85@ \$3; pool 10, \$2.60@ \$2.65; pool 11, \$2.25@ \$2.35. Lump is offered at \$5; egg and nut, \$5.50; slack, \$2.20. Run of oven coke was held at \$8.50 and sized coke at \$10 last week.

The Buffalo bituminous trade wallows in a slough of despond. Slack is going begging, with good coal seeking a market at \$1@ \$1.05. Prepared sizes are doing only a little better, relatively. Fairmont lump is nominally \$1.60@ \$1.75; mine-run, \$1.40@ \$1.50; slack, \$1.25@ \$1.40. Youghiogheny gas lump is held at \$2.25@ \$2.50; No. 8 steam lump, \$2@ \$2.25. Allegheny mine-run is \$1.75@ \$2.

#### New England Feels Reaction

The reaction following the settlement of the anthracite strike has set in in the New England market. While buyers realize that it will be several weeks before shipments of hard coal are moving in normal volume, life has gone out of the demand for substitute fuels.

Middle houses already have received cancellations of orders for prepared sizes of bituminous coal and more cancellations are expected despite the efforts the soft-coal trade will make to hold part of the tonnage won during the suspension of anthracite production. Trade interests not directly concerned with the sale of bituminous are inclined to discount the success of such efforts.

F.o.b. vessel at Hampton Roads, the spot market on pool 1 coal was somewhat firmer last week, although this week probably will see a mild reaction. Owing to heavy weather along the coast, an extra demand to clear ships developed, but accumulations were still the rule. Less frequent arrivals boosted prices on cars at Boston and Providence to a \$7 basis.

All-rail bituminous egg, stove and nut last week commanded \$6.50@ \$8.25. Lump was offered at 50c.@ 75c. less or in combination with egg and stove orders. High-grade central Pennsylvania low-volatile brought prices which compared favorably with the New River-Pocahontas range.

#### Strike Settlement Hits New York

The end of the anthracite strike comes as a sad blow to the New York bituminous market. Cancellations of orders for prepared sizes of coal and coke began to flow in as soon as the report of an anthracite agreement was confirmed. Prices, which early last

week were on the upgrade, began to slip back and this week probably will see further declines.

West Virginia smokeless coals withstood the shock the best. Prepared sizes of Pocahontas and New River were snapped up at \$7.50@ \$8.25. Central Pennsylvania low- and medium-volatiles were quoted at \$5@ \$7, and high-volatile prepared at \$3.50@ \$4. West Virginia splints ranged \$4.25@ \$5.75.

As was the case in New York, bituminous demand at Philadelphia was active the early part of the past week, but went to pieces when the news was flashed that the hard-coal struggle was over. Until cancellations began to appear, prepared West Virginia and central Pennsylvania low-volatiles commanded in the neighborhood of \$8.50 for prepared sizes. Prices on high-volatiles—Fairmont and Westmoreland—advanced to \$4.50 under increased buying demand and a slowing up in movement.

Transportation congestion was a factor in maintaining prices, which had not broken up to the Lincoln holiday. The only exception was slack, which has been very weak. Stocks of coal in retail yards are dangerously low.

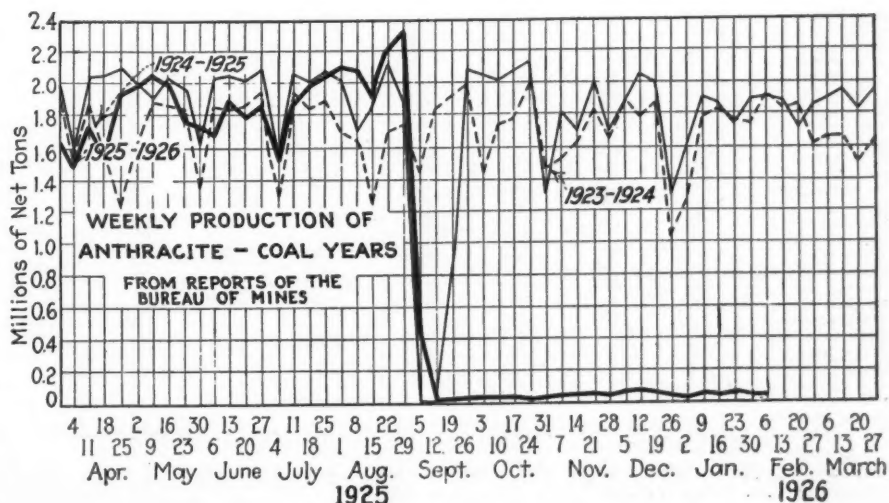
#### Baltimore on Hand-to-Mouth Basis

The Baltimore bituminous trade has been living on a hand-to-mouth basis. Retail stocks of low-volatile coals, which have come into favor as substitutes for anthracite, have been so depleted that many dealers have been making their deliveries to the householder direct from the cars. The steam trade is featureless. Accumulations of slack at the mines have impeded prompt shipment of the prepared sizes to the retail distributors.

Activity marked business at Hampton Roads the second week of the month. There was an increase in foreign demand and heavy shipments of slack to New York and Boston. This latter movement was at the expense of the Pennsylvania producers.

The Shipping Board paid \$4.81 for a cargo of pool 2 coal. Coastwise business generally has been hampered by bad weather, but inland trade has been brisk. Retail prices were unchanged.

There has been no improvement in demand for medium grade coals in the



### Car Loadings and Supply

	Cars Loaded	
	All Cars	Coal Cars
Week ended Jan. 30, 1926.....	925,263	183,071
Preceding week.....	921,734	180,923
Week ended Jan. 31, 1925.....	896,055	192,339
	Car Shortages	
	All Cars	Coal Cars
Jan. 30, 1926.....	250,935	92,040
Jan. 22, 1926.....	264,781	96,255
Jan. 31, 1925.....	213,921	69,736

Birmingham steam market. The better grades, however, are moving freely and Cahaba and Warrior field operators experience little difficulty in keeping production sold ahead. Coke ovens are taking liberal quantities of washed coals, pushing demand ahead of supply. The domestic market has settled down to a weather proposition.

Coke from the Birmingham district ovens is still in active demand. Egg and nut are quoted at \$6.50@ \$7 and foundry and gas coke bring \$7.

The settlement of the anthracite strike took the wind out of the sails of the coke interests shipping to the New York market. Quotations on sized coke, which went to \$15 the beginning of last week, dropped to \$12@ \$12.50; reclaimed coke fell from \$13@ \$13.50 to \$10@ \$10.50. Cancellations probably will force further radical cuts.

High prices for coke have increased the demand for low-volatile coal in the Philadelphia domestic market. The scarcity of prepared sizes has swung considerable business to mine-run, which has been retailing at \$9.50@ \$14. Culm, sold at \$1.50 f.o.b. banks, also has been in good demand from steam consumers, who mix it with the rice and barley they still have on hand.

#### Cancellations Crowd Coke

Connellsville's brief reign in the high-dollar domestic-fuel market is over. Within two hours after the anthracite

strike settlement was announced on Feb. 12, cancellations began to pour in on the ovens and their Pittsburgh representatives. Prior to that time run-of-oven coke was held at \$11@ \$11.50 and yard crushed coke at \$13@ \$13.50. Optimists still expect to receive more business from eastern retailers, but they are resigned to the fact that buying will be on a lower price basis.

The greater part of the production blown in when eastern buyers began to turn to coke for domestic consumption will be discontinued. Most of this tonnage would not be acceptable to the blast furnaces and the regular sources of supply for that trade undoubtedly will be able to hold the industrial business they now have. Contracts for the current quarter, averaging about \$4, will not be disturbed.

The Connellsville *Courier* reports coke output in the Connellsville and Lower Connellsville regions for the week ended Feb. 6 at 124,200 tons from the furnace ovens and 126,640 tons from the merchant ovens. Compared with the preceding week, furnace oven production increased 16,500 tons; merchant oven, 1,460 tons.

### Kitchen on Wheels Carries Cause of Smokeless Coal

The New England soft-coal campaign was placed upon wheels recently when Eugene C. Hultman, Massachusetts Fuel Administrator, gave the official send-off to the traveling kitchen of the Smokeless Coal Operators' Association of West Virginia. The unique outfit will tour cities in Massachusetts and New England. Experienced demonstrators will explain to householders how to burn the coal to get the best results. Samples of coal in various sizes from the New River and Pocahontas fields in West Virginia will be used in the demonstrations.

### Freight Loadings in 1925 Break All Records

The greatest freight traffic on record, measured by the number of cars loaded with revenue freight, was handled by the railroads of this country during the year 1925, according to the American Railway Association. Loading of revenue freight for the year totaled 51,177,962 cars. This was an increase of 2,643,529 cars, or 5.4 per cent, over 1924; 1,365,849 cars, or 2.7 per cent, over 1923, and 6,059,490 cars, or 13.4 per cent, over 1920.

The record traffic of 1925 was handled without transportation difficulties by the railroads and with practically no car shortage. Instead, the rail carriers have had at all times during the year no less than 103,000 surplus freight cars in serviceable condition, while they have also had at all times not less than 4,200 surplus serviceable locomotives.

In 20 separate weeks in 1925, beginning about the middle of July, loading of revenue freight has exceeded one million cars, the peak week being that ended on Aug. 29, when 1,124,436 cars were loaded, the greatest number for any one week on record. This exceeded by 12,091 cars, or 1.1 per cent, the previous high record made during the week of Oct. 24, 1924.

### U. S. Gets More British Coal

Lieut. Col. G. R. Lane-Fox, British Secretary for Mines, replying to a question in the House of Commons Feb. 9, said that 424,474 tons of coal had been exported from Great Britain to the United States during the four months which ended Jan. 31 at an average price of £1.17.7½ (\$9.09) a ton, f.o.b. In the corresponding period a year ago, he said, Great Britain exported to America 44,002 tons at an average price of £1.12.1½ (\$7.75) a ton, f.o.b.

## Estimated Monthly Output of Soft Coal in United States By States, 1925

(In Thousands of Net Tons)

State	January	February	March	April	May	June	July	August	September	October	November	December	Total
Alabama.....	2,013	1,590	1,516	1,451	1,477	1,513	1,656	1,863	1,931	2,051	1,976	2,120	21,157
Arkansas.....	173	107	86	74	79	82	106	121	129	149	152	152	1,410
Colorado a.....	1,217	828	621	564	604	599	602	761	931	1,145	1,168	1,250	10,290
Illinois.....	8,120	5,172	5,071	4,000	4,153	4,198	4,622	5,731	5,834	7,272	6,911	7,711	68,795
Indiana.....	2,666	1,700	1,721	1,413	1,401	1,438	1,309	1,748	1,859	2,182	2,076	2,354	22,067
Iowa.....	616	396	370	283	299	300	309	380	379	490	477	504	4,803
Kansas.....	485	327	278	252	250	245	286	339	350	422	419	439	4,092
Kentucky:													
Eastern.....	3,614	2,820	2,601	2,746	3,178	3,319	3,504	3,773	3,808	3,925	3,564	3,725	40,577
Western.....	1,165	768	769	682	676	783	879	1,199	1,200	1,335	1,412	1,556	12,424
Maryland a.....	235	189	170	148	155	164	210	230	236	242	258	277	2,514
Michigan.....	87	67	57	44	30	28	44	53	63	78	76	99	726
Missouri a.....	299	191	169	150	150	151	175	200	212	269	263	278	2,507
Montana.....	320	190	191	140	137	142	155	213	239	339	322	267	2,655
New Mexico.....	285	199	185	163	177	178	175	185	200	242	235	249	2,473
North Dakota.....	131	87	87	58	54	57	58	68	92	152	152	108	1,104
Ohio.....	2,854	2,308	2,329	1,984	2,156	2,284	2,415	2,715	2,869	3,297	3,160	3,191	31,562
Oklahoma a.....	292	168	150	133	139	141	166	188	185	218	231	228	2,239
Pennsylvania a.....	13,507	11,230	10,917	9,348	9,105	9,516	9,912	11,042	11,715	13,560	13,087	13,809	136,748
Tennessee.....	543	478	430	408	410	428	479	535	556	571	550	592	5,980
Texas.....	90	65	55	58	60	64	72	83	81	82	78	85	873
Utah.....	595	301	290	277	251	287	303	403	489	524	458	452	4,630
Virginia a.....	1,117	902	943	895	931	1,003	1,025	1,098	1,144	1,178	1,108	1,111	12,455
Washington.....	256	173	195	166	157	155	155	189	209	261	264	235	2,415
West Virginia a.....	10,449	8,217	7,917	7,890	9,063	9,701	10,355	11,226	11,421	12,345	11,621	11,283	121,488
Wyoming.....	793	507	501	367	375	383	401	531	676	865	754	734	6,887
Other States b.....	8	7	7	8	7	8	9	9	9	9	8	7	96
Total bituminous production.....	51,930	38,987	37,626	33,702	35,474	37,167	39,582	44,883	46,817	53,203	50,780	52,816	522,967

a Revised.

b Includes California, Georgia, Idaho, North Carolina, Oregon and South Dakota.

Issued by U. S. Bureau of Mines.



## Foreign Market And Export News

### British Demand Shows No Signs of Weakening; Prices on the Upgrade

A good tone prevails on the British steam coal market, and February prospects are bright. Demand proceeds steadily from all directions, and order books are in a healthy condition for the next two or three weeks. Consumers are not inquiring too far ahead, but up to the end of the new month there is a ready disposition to enter into business.

France is buying better than for months past, due to the comparative shortage of native coal and decline in reparation deliveries. Admiralty large coals are firm. Graded sized coals are a scarce and firm feature. Smalls are strongly held. Patent fuel inquiry is a little more active.

The first week of February opened on a very strong basis in the Newcastle market and the increased prices of the preceding week were easily maintained, with, in the case of best quality steams, a tendency to still further improvement. The contract and inquiry work has been on a good scale, 30,000 tons of gas coal and 30,000 tons of steam coal having been sold at current f.o.b. prices over the next three months in two contracts alone. There is a forward inquiry for February and March, which indicates that trade will be steady for the next two months.

Output by British collieries during the week ended Jan. 30, according to a special cable to *Coal Age*, totaled 5,495,000 gross tons, compared with 5,450,000 tons in the preceding week.

### Belgian Market Stronger

The Belgian market is strengthening very slowly, but surely. Domestic coals are still firm. In industrial sorts, there is a general improvement. Foreign competition is less effective from the Nord and Pas de Calais mines, because of the increase in French prices at the collieries. Scandinavian demands are clearing Dutch fuel out of the Belgian selling zone and British shipments are steadily declining.

In the Borinage district, stocks are drawn from and prices are strengthening. Screened coals are almost unprocurable, the more so as the French producers are no longer supplying those sizes. Semi-bituminous, quarter-bitumi-

nous and lean coals enjoy a good demand. Charleroi stocks are rapidly decreasing. The rubbly culms used for lime and brick making hold at 66 fr.

There are coke contracts frequently made at 120 fr. per ton.

The briquet market seems to have recovered from the dullness which weighed upon it so long. An arrangement has been made between the producers and the State Railways fixing a price of 100 fr. on all first quarter consumption this year. For the last quarter the producers are asking for 97 fr., which is less than prices on the open market during the last quarter of 1925.

### French Coal Market in Strong Position; Coke Prices Up

Paris, France, Jan. 27.—There is a satisfactory demand for French industrial coals. The production of domestic fuels is not sufficient to cover requirements, compelling merchants in the Parisian districts to buy from Great Britain in order to make up the deficiency in flaming screened from Marles and Bruay, at delivered prices 10@15 fr. higher than on the French coal.

There is some improvement as far as transports are concerned.

At the present time there are 37,000 tons of Russian anthracite stored at Rouen. Of this only 10,000 tons have been sold. The commercial representatives of the Soviets in France indicate the following prices per ton for that anthracite, c.i.f. Rouen; 1 to 2 (French nuts). 52s. 9d. (343 French fr.); 2 to 3 (cobbles) 50s. (325 fr.); 2 to 5 (cobbles) 48s. 9d. (318 fr.); large and lumps 37s. (240 fr.). To the above prices must be added 20 fr. per ton for delivery on quay or loading into river barges, and 20 fr. per ton for the river freight to Paris. Russian nuts and cobbles from crusher are quoted by the French sellers 360 to 370 francs per ton at Rouen. That Russian anthracite contains about 4 per cent volatile matters, 3 to 4 per cent ash and 4 per cent moisture.

During the first twenty-six days of January, 217,310 tons of reparation coke have been received from the Ruhr. As a result of the two successive increases applied upon the Nord and Pas de Calais coke prices, and the fall of the franc as compared to the gold

mark, the O.H.S. has informed the O.R.C.A. that the reparation coke price will be increased 7.15 for the first fortnight of January, and 6 francs from Jan. 16. Reparation coke priced at 144 fr. in December, is now 157.15 fr. However, the 2.50 fr. return allowed for big tonnages is to be deducted from the above price. On the other hand, the O.R.C.A. surcharges on the reparation coke price, makes the rate 158.30 fr. (the 2.50 return not included).

Figures obtained by Assistant Commercial Attaché Evans from the Geological Survey of China, which are reported to be accurate, show that China's production of coal amounted to 23,711,103 tons in 1924. This is an increase over production for the previous year of slightly over 150,000 tons. In obtaining these figures the output of the small mines from which no returns are received is estimated as being the same for both years or 6,000,000 tons.

### Export Clearances, Week Ended Feb. 13, 1926

#### FROM HAMPTON ROADS

	Tons
For Italy:	
Br. Str. Torr Head, for Venice.....	496
Ital. Str. Concordia, for Porto Ferrajo	9,145
Ital. Str. Fortunato, for Genoa.....	5,838
Ital. Str. Hermada, for Savona.....	6,499
Ital. Str. Brenta, for Genoa.....	2,885
For French West Indies:	
Nor. Str. Sverre, for Fort de France.	5,202
For Cuba:	
Br. Str. Tafna, for Havana.....	6,572
Nor. Str. Lalla, for Havana.....	2,604
Dan. Str. Sarmatia, for Antilla.....	1,329
For New Brunswick:	
Br. Str. Emperor of St. John, for St. John	2,674
For Canal Zone:	
Amer. Str. Chilore, for Cristobal.....	19,962
For Argentine:	
Ital. Str. Ello, for Buenos Aires.....	6,985

### Hampton Roads Coal Dumpings\*

(In Gross Tons)

	Feb. 4	Feb. 11
N.W. Piers, Lamberts Pt.: Tons dumped for week.....	158,403	188,175
Virginia Piers, Sewalls Pt.: Tons dumped for week.....	76,690	90,181
C. & O. Piers, Newport News: Tons dumped for week.....	111,572	122,210

\*Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shipper's protest.

### Pier and Bunker Prices, Gross Tons

#### PIERS

	Feb. 6	Feb. 13†
Pool 1, New York.....	\$6.00@ \$6.35	\$6.00@ \$6.25
Pool 9, New York.....	5.50@ 5.75	5.50@ 5.75
Pool 10, New York.....	5.25@ 5.50	5.25@ 5.50
Pool 11, New York.....	4.85@ 5.25	4.85@ 5.25
Pool 9, Philadelphia.....	5.50@ 5.80	5.55@ 5.85
Pool 10, Philadelphia.....	5.30@ 5.50	5.35@ 5.50
Pool 11, Philadelphia.....	4.90@ 5.20	5.00@ 5.25
Pool 1, Hamp. Roads.....	5.00@ 5.10	5.00@ 5.10
Pool 2, Hamp. Roads.....	4.65@ 4.75	4.80@ 4.90
Pools 5-6-7, Hamp. Rds.	4.40@ 4.50	4.40@ 4.50

#### BUNKERS

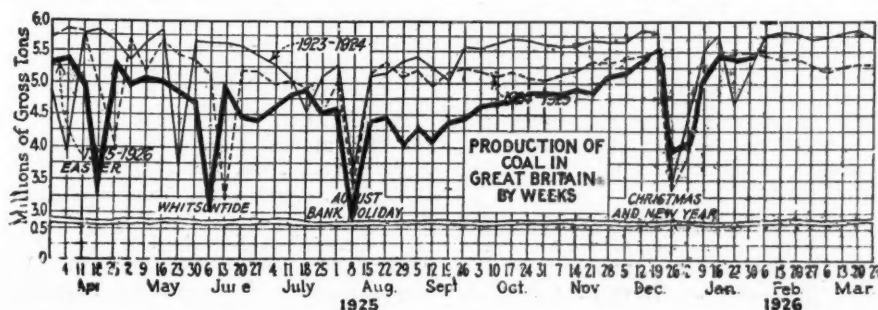
Pool 1, New York.....	\$6.25@ \$6.50	\$6.25@ \$6.50
Pool 9, New York.....	5.75@ 6.00	5.75@ 6.00
Pool 10, New York.....	5.50@ 5.75	5.50@ 5.75
Pool 11, New York.....	5.10@ 5.50	5.10@ 5.50
Pool 9, Philadelphia.....	5.75@ 6.00	5.80@ 6.05
Pool 10, Philadelphia.....	5.55@ 5.75	5.60@ 5.75
Pool 11, Philadelphia.....	5.15@ 5.45	5.25@ 5.50
Pool 1, Hamp. Roads.....	5.10	5.10
Pool 2, Hamp. Roads.....	4.75	4.90
Pools 5-6-7, Hamp. Rds.	4.50	4.50

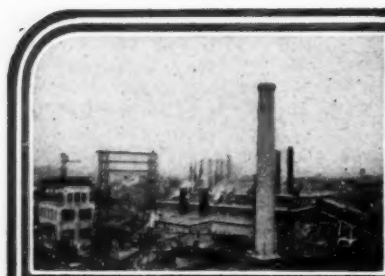
### Current Quotations, British Coal, f.o.b. Port, Gross Tons

Quotations by Cable to Coal Age

	Feb. 6	Feb. 13†
Cardiff:		
Admiralty, large.....	23s. 3d.	23s. @ 24s.
Steam smalls.....	14s. 6d.	14s. 6d.
Newcastle:		
Best steams.....	16s. 7d. @ 19s.	17s.
Best gas.....	16s. 7d. @ 18s.	17s. 6d.
Best bunkers.....	16s. 6d.	17s. @ 18s.

†Advances over previous week shown in heavy type; declines in italics.





## News Items From Field and Trade



### ALABAMA

The Birmingham Coal & Iron Co. has to clear the ground and repair tenant houses and mine structures at the old Inland No. 1 mine, near Inland, Blount County, which has been idle since 1920, when it was operated by the Inland Coal & Iron Co. This is a drift opening on the Jagger seam of coal and is served by the Birmingham Mineral branch of the Louisville & Nashville R.R. It is understood that the mine will be developed up to a daily output of 1,000 tons as soon as practicable. I. E. Boyette is president of the company, the operating office being located at Inland, near Oneonta.

The first work of organizing in convict operations chapters of the Joseph A. Holmes Safety Association was inaugurated recently at the Aldrich mines of the Montevallo Coal Mining Co., when four chapters were instituted from the membership of the mine workers, one each for colored and white convicts and one each for the colored and white free employees.

The Pratt Fuel Corporation is reported to be making preparations for greatly increasing its output at Cedron No. 1 mine, near Carbon Hill, which was purchased from the Kershaw Mining Co. last year. This is a stripping operation on the Jagger seam and a large steam shovel recently was authorized to be purchased for this mine. It is understood that consideration also is being given to the building of a large washery.

### ARKANSAS

Representative Hearstill Ragon of Arkansas introduced a bill in the House at Washington to authorize the Secretary of the Interior to establish a mine-rescue station at Spadra, Johnson County, in the heart of the Arkansas coal district. The measure also directs that suitable equipment and suitable quarters be provided for the proposed station. It was referred to the Committee on Mines and Mining, where favorable action is expected. A similar bill will be introduced in the Senate by Senator Robinson. The House committee will begin hearings on Ragon's and other measures of similar purport Feb. 19.

### COLORADO

The explosion in the mine No. 3 of the Bear Canon Coal Co., at Bear Canon, on Jan. 29, which resulted in the death of four coal miners, was caused by a set-off of gas in some old abandoned workings where men were engaged in drawing rails, according to the findings

of the coroner's inquest held at Bear Canon Feb. 6. The verdict of the coroner's jury further found that the company was at fault in not making examinations for gas on the morning the men entered the mine, the last inspection prior to the explosion having taken place two days earlier, on Jan. 27. It was not determined what set off the gas. The mine itself was a non-gaseous mine and miners worked with open lights.

The Radiant mine of the Victor-American Fuel Co. was closed down at the end of January. The Chandler mine of the same company, however, has been working every day. Several mines in this district have cut down their work to two or three days a week, because of a lack of orders. Wagon mines, however, as a rule are working steadily.

### ILLINOIS

Frank W. Collins, of East St. Louis, has been appointed county mine inspector of St. Clair County by the Board of Supervisors. There were 11 applicants for the vacancy created by the resignation of W. A. Wilson who has accepted a position as manager of the Randall mine at Freeburg.

Saline County coal mine No. 4, about four miles west of Carrier Mills, has closed down, making the third mine that has closed recently in the vicinity of Carrier Mills.

Posting of suspension notices in mines No. 9, at West Frankfort, and No. 12, at Christopher, operated by the Old Ben Coal Corp. is regarded as marking the first step in a general slowing down of production in the southern Illinois fields. An indefinite suspension is contemplated. The West Frankfort shaft employs about 800 men and No. 12 about 600. The Old Ben corporation has four other mines in that section which are working.

### INDIANA

A report from Evansville states that the Korff mines, Possum Ridge Mine and Sargeant mine in the Evansville district have resumed on a non-union basis, and others out toward Rockport will start soon. While these mines are working short forces, the report indicates that more men are reporting, and in view of smaller demand for coal, indications are that they will soon have a waiting list.

Articles of incorporation for the A. D. Spears Coal Co., which will take over the business and property of the Vermillion Coal Co., have been filed in

Terre Haute. The incorporators and directors of the new company are: Archibald D. Spears and Ira J. Church, of Clinton, and Thomas H. Cochran, of Chicago. The property to be taken over by the company is located in the Terre Haute field and is valued at approximately \$550,000, exclusive of the good will.

The East Chicago Coal Co., East Chicago, has filed a final certificate of dissolution.

William L. Williamson, Indiana coal operator, has disposed of his interest in the Neutral Coal Producing Co. and the Sanford Mining Co. and has opened offices in the Rea Building, Terre Haute, under the name of W. L. Williamson & Co. He will do a jobbing business in all grades of Indiana coal and expects to organize a coal mining company of his own.

The Parke County Coal Co. of Terre Haute, has filed a final certificate of dissolution.

### KANSAS

Authorization by the receiver of the Joplin & Pittsburg Railroad Co. for the construction of a track from Pittsburg one and one-half miles west to the site of the Lone Star Coal Co.'s mine, was announced Feb. 8. J. J. Nesch and R. G. Nesch, owners of the Lone Star company, recently purchased 135 acres of coal land, on which they expect to have a shovel in operation soon. Bruce Cameron, general manager for the J. & P., says easements for the track have been obtained and construction will start soon.

Plans are being discussed for the eighth annual state first-aid and mine-rescue meet, which, James Sherwood, state mine inspector, and Harry W. Burr, secretary-treasurer of District 14, United Mine Workers, recently announced, will be held either late in May or early in June. Eighteen teams competed in the contest last year, but because of the greater interest in first-aid and mine-rescue work displayed this year by the organization of many classes in the southeastern Kansas field, Mr. Sherwood expects a greater enrollment for the 1926 meet.

### KENTUCKY

The Mitchell Willis Coal Co., Typo, has filed amended articles reducing its capital stock from \$100,000 to \$10,000.

H. S. Carpenter has been appointed general manager of the Elkhorn division of the Consolidation Coal Co., with headquarters at Jenkins, vice G. W. Hay, transferred to general manager



of operations, Fairmont, W. Va.; J. F. Daniel has been appointed general superintendent of the Elkhorn division with headquarters at McRoberts, vice H. S. Carpenter, promoted; M. H. Foerster has been appointed assistant general superintendent of the Elkhorn division with office at Jenkins, vice J. F. Daniel, promoted.

The Black Diamond Mining Co., Drakesboro, recently donated a day's run of coal and the miners donated a day's pay to the four churches at Drakesboro, two of which have colored congregations, to aid their finances, which got behind during the strike of 1924.

### NEW YORK

Maurice Bloch, Democrat, minority leader, on Feb. 11 introduced in the Assembly a bill amending the Public Service Commission law empowering public service commission to investigate concerning coal supply, source, storage and price of coal and other facts relating thereto.

### OHIO

The United Mine Workers was made defendant in two damage suits totaling \$600,000 in Common Pleas Court at St. Clairsville Feb. 10. The suits were brought by Scott Story and Mrs. Clyde Majors as the result of a strike riot at New Lafferty, Belmont County, June 27, 1922. The New Lafferty riot was the result of a demonstration by union men against Majors and Scott, who had gone to work in a non-union stripping mine near the village. John Majors was shot and killed and two other men were shot and badly beaten.

Erection of a pier on the Kentucky side of the Ohio river, opposite Cincinnati, to cost approximately \$110,000, to provide a harbor for steamers and coal barges was favored by a number of officials of coal companies and steamship lines at a public hearing held in the office of Major A. K. B. Lyman, U. S. District Engineer at Cincinnati, Feb. 10. Among those who spoke were: R. P. Gilham, F. E. Hall, James P. Reilly, F. J. Bramlage, F. P. Nowell and A. L. Kirchner.

Major E. S. Helburn was appointed and has qualified as receiver for the Kentucky Fuel Co., of Cincinnati, Ohio, which asked for receivership in the U. S. Court in Covington, Ky., on Feb. 9. This is a selling corporation but also is financially interested in Clay County Coal Co.'s Nos. 1 and 2, the Willis Harlan Coal Co. and the Turner Jellico Coal Co., of Kentucky, and the Coaldale Products Co., of Ohio. According to John Hoffman, principal stockholder, it is hoped through this method to clear up the financial entanglements of all five companies.

### OKLAHOMA

A report from the Henryetta field, District 21, United Mine Workers, where a strike was called Sept. 1, 1925, showed that in the week ending Feb. 6 more than 13,000 tons of coal was mined. Of this, nine open-shop mines,

paying the 1917 scale, produced 10,265 tons; eight co-operative mines produced 1,460 tons and three union mines, paying the 1924 scale, produced 1,470 tons. Three mines, nominally open, one in each class, were idle through the week. Those working are experiencing difficulty marketing their product. And the Crowe Coal Co. has announced it soon will close down one of the two mines it has in the field operating on the 1917 scale.

### PENNSYLVANIA

Hearings are to be resumed in Scranton, Feb. 28 in a \$5,000,000 suit against the Glen Alden Coal Co. for alleged breaches of contracts, involving leases of 800 acres of coal land. Both actions are based on leases entered into in 1864 and 1868 by relatives of the plaintiffs and agents for the defendants. In addition to money damages, the plaintiffs ask for complete termination of the coal company's operations on their property. Hearings are expected to continue through the spring before former Judge Frank C. McLaughlin, who was appointed referee by the Supreme Court of Broome County, New York. Complaints by the lessors of what are known as the Central and Luzerne leases were first made by Helen B. Millard and Charles P. Bennett, owners and lessors of the property in 1921, and amended complaints were filed in September, 1922, both drawn against the Delaware, Lackawanna & Western R.R., whose liability in the action is admitted to have passed to the Glen Alden Coal Co. upon segregation of the anthracite mining company.

Dynamite enough to blow Rush township clear out of Centre County was found under the tippie of the DuShan mine, near Osceola Mills, on the night of Feb. 11. The dynamiters bungled the job and the charge failed to go off. The DuShan mine is owned and operated by James Dugan, of Osceola Mills, and John F. Short, of Clearfield, and has been working for some time. State, railroad and county detectives are working on clues.

Output at the Pittsburgh Coal Co.'s seven mines now working at the 1917 scale in the Pittsburgh district set a new high record in the week ended Feb. 6, when 32,387 tons was produced. The company reports that the number of miners working in the Pittsburgh district under the 1917 wage scale reached a new high record on Feb. 11 with 1,717 men at work in seven mines, distributed as follows: Banning No. 1, near West Newton, 295; Banning No. 2, 276; Midland, near Canonsburg, in Washington county, 374; Montour No. 10, 333; Warden, 284; Mansfield, 67, and Dickson, near Imperial, 88.

### UTAH

H. F. Fernstrom, manager of the Western Fuel Co. and well known in Salt Lake City retail coal circles for several years past, has been elected president of the Associated Retail Credit Men.

Fire caused about \$10,000 damage recently to the material house of the

Independent Coal & Coke Co. near the tippie at Kenilworth. The fire brigade saved the slack conveyor from destruction. Work is about finished on the new material shops of the company, and for this reason the old building may not be repaired.

### WEST VIRGINIA

Because of the absence of Robert M. Lambie, chief of the State Department of Mines, the inquest to determine the cause of an explosion in Jamison mine No. 8 of the Jamison Coal & Coke Co., at Farmington, was again postponed, this time until Feb. 26. The inquiry will be held in Fairmont.

Announcement has been made here that 45.62 acres of Sewickley or Mapletown coal and 32.94 acres of surface, besides a leasehold on three acres of surface, and all mining machinery and equipment now upon the property owned by the Stone & Scott Coal Co., known as Betty mine, will be sold at public auction at a special commissioners' sale at the Marion County Court House Feb. 20. Besides the above-named property, which is located in Grant District, Marion County, on the Baltimore & Ohio R.R., the sale also will include all of the real and personal property of E. B. Stone and T. M. Scott, conveyed to them by the Hudson Coal Co. in 1920, situated in Harrison County.

Work of rock-dusting Mine No. 86 of the Consolidation Coal Co., at Carolina, has been started, and will be completed in a week or 10 days, it is said. This is the first of the Consolidation mines in this region to receive the rock-dust treatment. Work probably will be started soon on rock-dusting Federal mine No. 3 of the New England Fuel & Transportation Co., at Everettsville.

G. A. Richardson, manager of the technical publicity department of the Bethlehem Steel Corporation, with headquarters in Bethlehem, Pa., was the principal speaker at a safety meeting recently held by the Bethlehem Mines Corporation at its Barrackville mine No. 41.

The U. S. Court of Appeals has set aside the motion of the West Virginia-Pittsburgh Coal Co. for a writ of error in its case against Van A. Bittner, chief international representative of the United Mine Workers, and others, according to information received at the Fairmont office of the Mine Workers from Thomas C. Townsend, chief counsel of the organization. By this action Mr. Bittner is purged of the contempt charges that have been pending in federal court. The remarks made by Mr. Bittner in an address at Farmington, Marion County, early last year resulted in the charges of infringing upon an injunction granted to the coal company in the Panhandle section. Federal Judge W. G. Baker dismissed the proceeding which was later appealed by the coal company.

William Anderson Staab has been appointed assistant professor of mining engineering at West Virginia University to fill the vacancy caused by the

resignation of Thomas Fraser. Mr. Staab is a graduate of Lehigh University, class of 1910. Since graduating he has spent ten years in mining engineering work at Morenci, Ariz., one year teaching at Lehigh University, and for the past four years has been a mining engineer for the Lehigh Coal & Navigation Co. at Lansford, Pa.

A total of approximately \$100,000 will be paid by the State Compensation Department to the widows and orphans of the men who lost their lives in the recent mine explosion at Farmington. Within less than 24 hours after the explosion at Farmington, representatives of the compensation department had set the machinery in motion for making payments.

One hundred coke ovens of the Houston Collieries Co. at Maitland, will be fired as soon as they can be put in condition. Men have been put to work repairing them.

The Crozer Coal & Coke Co. recently completed the installation of a preparation plant having a capacity of about 3,000 tons a day. The new plant, which is at Elkhorn, is similar in design to the one completed about five years ago at Pageton, but a number of improvements have been made. A similar but larger plant is to be built at the Upland mine of the Crozer company.

The Blue Ridge Coal Corporation, operating at Brush Creek, on Coal River, is building two large tipples which will be completed within a comparatively short time.

Plans are being drawn for a large tippie for the Guyan Eagle Coal Co. at Amherstdale, in Logan County, to handle coal from the company's Chilton mine. This tippie will replace one destroyed by fire about two weeks ago. Long leaf pine is being used for the reconstruction.

In the interest of the bondholders of the Sullivan Pocahontas Coal Co., having a number of operations in West Virginia, Howard N. Eavenson, consulting mining engineer, Union Trust Building, Pittsburgh, Pa., who has been acting in the above capacity for the company, has been made president and general manager, and H. W. Frey, of New York, has been made vice-president and treasurer; succeeding J. C. Sullivan, of Tralee, who had been president, treasurer and general manager.

Rock-dusting at the No. 9 mine of the Jamison Coal & Coke Co. will be completed within a few days, according to W. Clark Dobbie, superintendent, who also reports that the work has speeded up in the last few days.

### WYOMING

The Union Pacific Coal Co. produced 2,779,061 tons of coal in its 17 mines in 1925. In an effort to further reduce all classes of accidents, the company has instituted a new system of daily inspection of all mines for gas and loose top before each shift goes on duty. In addition to this, a joint committee representing the United Mine Workers locals and the company makes an inspection of general committees each quarter. Among the safety moves instituted during the past year were con-

tinuous rock-dusting of all mines, improved ventilation, Edison safety lamps for all miners, prohibition of smoking tobacco or matches in the mines, electric shotfiring by specialized shotfirers after all men have left the mines.

P. J. Quealy, president of the Kemmerer Coal Co. and of the Gunn-Quealy Coal Co., has been named as one of the Wyoming members of the advisory council for the sesquicentennial celebration to be held in Philadelphia this year.

The Union Pacific Coal Co. recently formed a safety association among its employees. Men of all occupations connected with the company's mines are eligible for membership. This company regularly sends out bulletins of all serious accidents showing how the accident occurred and how it could have been avoided.

### CANADA

Premier E. N. Rhodes, of Nova Scotia, has promised District 26, United Mine Workers, that the provincial government will advance a loan of \$13,000 to be devoted to relief purposes in the colliery district of Cape Breton. The British Empire Steel Corporation has promised to make a similar donation provided the union will supply funds for the relief of distress.

G. H. Kirkpatrick, chairman of the Vancouver Harbor Board, announced on Feb. 8 that options had been taken on sites on the harbor front at North Vancouver for the erection of a coal pier of about 10,000 tons capacity for bunkering steamships, which now have to cross over to Vancouver Island to bunker. Recently the Blue Funnel Line, which had been in the habit of bunkering its ships at Vancouver Island coal ports, let a contract for the bunkering of its ships to the Pacific Coast Coal Co., of Seattle, in order to avoid crossing the strait. It is proposed that the bunkers be operated under a system whereby ships will purchase coal directly from the mine operators in various parts of British Columbia and Alberta, and the Harbor Commission will collect a commission from the operators for handling the business.

### Personal

There is an opening on the editorial staff of *Coal Age*. Please address J. E. Spurr, *Coal Age*, 10th Ave. and 36th St., New York, giving such information as would be of interest.

### Traffic

#### Proposed Midwest Rate Cuts Cancelled by I. C. C.

The Interstate Commerce Commission, in I. & S. Docket 2483, finds certain proposed reduced rates on coal over the Missouri Pacific, Burlington, Illinois Central, Chicago & Eastern Illinois and Mobile & Ohio railroads from points in the southern Illinois, Murphysboro, Centralia and Duquoin districts to St. Louis, Mo., and nearby

points not justified, cancels the suspended schedules and discontinues the proceeding.

The respondents sought to reduce the present rate of \$1.385 (applying from southern Illinois group to St. Louis) to \$1.35. The reductions to St. Louis proposed from the Duquoin, Centralia and Murphysboro groups were 0.5c., 1c. and 3c. respectively.

Voluntary attempt of three Western railroads to reduce coal haulage rates from Illinois mines to points further west has been halted by the Commerce Commission.

The new schedules, which were to have become effective Feb. 7, were suspended until June 7, to await the result of an investigation. The commission did not explain the action.

The Wabash, Big Four and Chicago & Alton published schedules to apply on shipments from the mines along their lines. The commission said that from Springfield, Ill., the rate to Keokuk, Iowa, on lump coal is \$1.89 per ton, and that it would have become \$1.75 under the new schedule. To Hannibal, Mo., the rate on slack, which is now \$1.60, would have become \$1.50. On run-of-mine coal the changes were less noticeable and the rates were not changed in many cases.

#### Protest Illinois-Indiana Rates To Chicago and Wisconsin

Six petitions relative to coal freight rates from the Indiana and Illinois fields to Chicago territory and points in Wisconsin have been filed by Indiana and Illinois operators with the Interstate Commerce Commission, the Indiana Public Service Commission and the Illinois Commerce Commission.

The traffic departments of the two state operators' organizations each filed two interstate complaints, asking a hearing on the reasonableness of the rates from their respective fields to Chicago territory and consuming points in Wisconsin and also on the relation of such rates to those in effect between the same points of destination and the Kentucky-West Virginia fields. The two interstate complaints involve the reasonableness of the rates from the two producing fields to points in the Chicago territory within their respective states.

A joint hearing on all of the complaints will be held Tuesday, March 23, in Chicago, before the three commissions with which the petitions were filed.

### Obituary

Death removed one of the well known figures in the coal industry of southern West Virginia on Feb. 6, when James Clark, who for more than twenty years had been identified with the industry, passed away at the Chesapeake & Ohio Hospital in Huntington. Death was due to pneumonia. Mr. Clark was born in Renfrew, Scotland, in 1850, and came to this country in 1903. At that time he became superintendent of the White Oak Coal Co., a position he held until appointed a member of the Chesapeake & Ohio Car Allotment Commission. After serving for five years on that commission Mr. Clark organized a company of his own in the Coal River and Elk River mining fields and continued to give his attention to the management of his properties until about three years ago, when he retired from business owing to failing health.



## Coming Meetings

**The Rocky Mountain Mining Institute.** Winter meeting, Feb. 23-25, 1926, at Albany Hotel, Denver, Colo. Secretary, Benedict Shubart, Boston Building, Denver, Colo.

**Canadian Institute of Mining and Metallurgy.** Twenty-eighth annual and general meeting, March 3-5, at the Windsor Hotel, Montreal, Quebec, Canada. Secretary, G. C. Mackenzie, 603 Drummond Bldg., Montreal, Que., Canada.

**New England Coal Dealers' Association.** Annual meeting at the State Armory, Worcester, Mass., April 7 and 8. Secretary, E. I. Clark, 141 Milk St., Boston, Mass.

**The American Mining Congress.** Annual Exposition of Coal Mining Equipment, May 24-28, at Cincinnati, Ohio, in conjunction with the annual meeting of practical operating officials. Assistant secretary, E. R. Coombes, Washington, D. C.

**International Geological Congress.** The fourteenth congress will be held in Madrid, Spain, commencing May 24, 1926. From May 5 to 22 excursions of interest to the visiting delegates will be arranged. Information concerning the congress can be obtained from the secretary of the organizing committee, Enrique Dupuy de Lome, Plaza de los Mostenses, 2, Madrid, Spain.

**Western Canada Fuel Association.** Annual meeting at Winnipeg, Manitoba, Can., May 27 and 28. Secretary, W. H. Morrison, Winnipeg.

**American Wholesale Coal Association.** Annual meeting, June 7-9, at Toledo, Ohio. Treasurer, R. B. Starek, Union Fuel Bldg., Chicago, Ill.

**Association of Iron & Steel Electrical Engineers.** Exposition and convention at Hotel Sherman, Chicago, Ill., June 7-10. Secretary, J. F. Kelly, 1007 Empire Bldg., Pittsburgh, Pa.

**American Society of Mechanical Engineers.** Spring convention at San Francisco, Calif., June 28-30. Secretary, Calvin W. Rice, 29 West 39th St., New York City.

## New Companies

**The Etter Coal Co.,** Cleveland, Ohio, has been incorporated with a capital of 500 shares of stock, no par value, to operate coal mines and do a jobbing business in coal and coke. Incorporators are: George S. Etter, Dorothy Dean, J. W. Gooch, M. A. Moran and A. W. Young.

**The Garland Coal & Mining Co.** was recently incorporated in McAlester, Okla., with a capital stock of \$200,000, by J. G. Puterbaugh, E. P. Joyner and others.

## Publications Received

**Analyses of Alabama Coals.** Bureau of Mines, Washington, D. C. Technical Paper 347. Pp. 111; 6 x 9 in.; tables. Price 15c.

**Value of Bituminous Coal and Coke for Generating Steam in a Low-Pressure Cast-Iron Boiler.** by C. E. Augustine, James Neil and William M. Myler, Jr. Bureau of Mines, Washington, D. C. Technical Paper 367. Price 10c. Pp. 45; 6 x 9 in.; illustrated. This is the second in a series of reports dealing with combustion, at low rates, of various typical fuels in boilers and furnaces suitable for heating large buildings.

**Mine Timber Used Underground,** compiled in co-operation with the Forest Service, Department of Agriculture, and the Geological Survey, Bureau of the Census, Department of the Interior, Washington, D. C. Price 5c. Pp. 17; 6 x 9 in.; tables. Devoted chiefly to statistics received from principal classes of timber-using mines in the United States, including anthracite and bituminous coal mines.

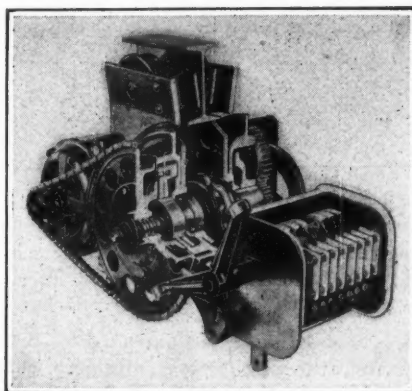
**The Miner's Freedom,** by Carter Goodrich. Marshall Jones Co., Boston, Mass. Pp. 189; 5 x 7 1/2 in.; illustrated.

**Methods and Costs of Rock-Dusting Bituminous Coal Mines,** by C. W. Owings and C. H. Dodge. Coal Mining Investigations under the auspices of Carnegie Institute of Technology, U. S. Bureau of Mines and Advisory Board of Coal-Mine Operators and Engineers. Price \$1.50. Carnegie Institute of Technology, Pittsburgh, Pa. Bulletin 18. Pp. 192; 6 x 9 in.; illustrated.

## New Equipment

### Electric Chain Hoist Is Strong and Efficient

A new ball-bearing electric chain hoist known as Model 20B recently has been developed and placed on the market by the Yale & Towne Mfg. Co., of Stamford, Conn. This hoist is the result of many years' experience in developing and building electric machines of this variety ranging from 1/4- to 2-ton capacity. It embodies such features as close headroom, long lift, high speed, automatic top and bottom limit stops,



Part Sectional View of New Hoist

Low head room and high lifts as well as careful construction and efficiency are distinguishing characteristics of this hoist. Ball bearings and alloy steel together with careful design do much toward attaining the desired results.

and greater over-all strength. This hoist has been built with unusual factors of safety in the load-supporting members and is designed to withstand the shocks common to this class of equipment. All suspension members are made of the highest quality steel.

The model 20B can be quickly adapted to any overhead system. The side plates of the trolley carriage can be spaced to fit any desired beam flange. Electrically welded steel chain can be furnished for varying lengths of lift. The centralized steel suspension means a constantly balanced load on the trolley wheels and hoisting unit irrespective of load position.

The mechanism is fully inclosed in oil-tight chambers. It is compact yet easily accessible for inspection without expert service. The ball-bearing load sheave, which is a late development, adds a big factor for low current consumption and general all-around hoisting efficiency.

Large chrome vanadium steel ball bearings surrounding the substantial steel load sheave reduce friction and make this hoist highly efficient, requiring minimum power and assuring increased life. The heavy one-piece steel load sheave, ground on an arbor to give perfect concentricity for the ball races, is bronze-bushed for the driving pinion. Splash lubrication provides a continuous flow of oil over all gears, pinions and bearings.

The driving pinion, the shaft of which passes through the load sheave, is machined from a single drop forging, after which it is heat-treated. The bearing surfaces on the shaft are accurately ground.

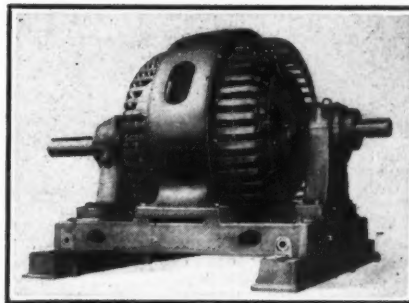
Steel chain containers can be furnished to hold any length of slack chain up to 60 ft. for 1/4-, 1/2- and 1-ton, and 30 ft. for the 2-ton hoists. These containers are secured to the under frame of the hoist and do not affect the headroom.

### Magnetic Clutch Built Into Standard Synchronous Motor

A new type of synchronous motor recently has been developed to meet the need for a machine having extra high starting torque, a low starting current, and the recognized high efficiency and unity power-factor characteristics of the synchronous type. The new motor, available in standard ratings from 60 to 600 hp., with larger ratings as special machines, is being manufactured by the Westinghouse Electric & Manufacturing Co., of East Pittsburgh, Pa. It consists of a combination of two pieces of apparatus each of which has established its utility in the electrical power field.

This combination embodies a standard synchronous motor combined with a magnetic clutch. It forms a compact unit, the over-all dimensions being practically the same as those of the hitherto standard synchronous motors of the same ratings, with the exception of the length, which is from 4 to 10 in. greater. It combines in the one machine the high starting torque of the wound-rotor induction motor with the desirable operating characteristics peculiar to the synchronous machine.

This synchronous motor is started in the same manner and with the same equipment that is employed with the standard synchronous type brought into action under light load conditions. It is particularly adapted for driving loads requiring high starting effort. The starting torque of this clutch-type motor is the same as its maximum run-



Synchronous Motor with Built-in Clutch

Heretofore despite its manifold advantages the synchronous motor has suffered the handicap of low starting torque. Building in a magnetic clutch obviates this difficulty and renders this type of machine available for uses to which, in the past, it has been but ill adapted.

ning torque, since the machine is brought to synchronous speed and fully excited before the load is applied. Thus it can exert any required turning effort up to its pullout torque during starting periods. This is accomplished without shock and at an acceleration rate that may be varied by adjusting the clutch excitation current by means of a rheostat control. The clutch cannot be excited during the starting period, and as a result the rotor quickly reaches full speed.

The rotor section of the clutch is faced with asbestos lining, riveted to a steel ring and made in halves to facilitate easy removal. The armature member of the clutch has a smooth surface where it comes in contact with the brake lining. Steel shims may be inserted between the asbestos lining and the ring to compensate for wear.

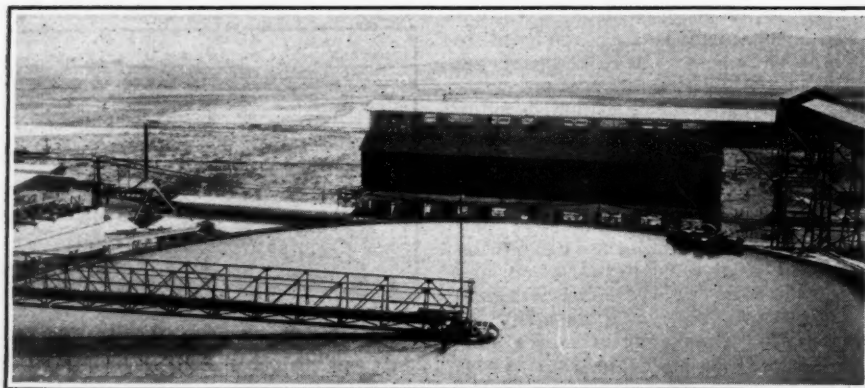
Ample clearance between the clutch faces is provided by spring-plate construction. The armature member is mounted on a steel disc which has sufficient flexibility to allow the clutch faces to come into contact when the clutch coil is excited. When excitation is removed, the flexible member springs back into its normal position which provides sufficient clearance between the friction surfaces to prevent contact.

The motor shown in the illustration, rated at 575 hp. at 180 r.p.m. and with 100 per cent power-factor, occupies but 2½ in. more space than would a standard machine of the same rating. The new single unit motor is 49 in. shorter than a standard machine fitted with separate magnetic clutch and outboard bearing. A corresponding reduction in floor space may be realized with other sizes of this type of machine.

### Small Diameter Traction Thickener Saves Space

Recovery of sludge or fine material from the wash water is becoming an important process at many coal preparation plants. In the past, traction thickeners of large diameter have thoroughly demonstrated their utility, but during the past year the Dorr Co., of New York, has developed a machine of this kind which is now available in as small a diameter as 20-ft.

This traction type of thickener is of the peripheral drive type, and embodies several advantages over the older machines of the central drive variety.



**Small Thickeners of This Type Are Now Available**

Thickeners of this type possess several advantages over those of the center drive variety. Chief among them, however, is the lessened headroom required by this machine.

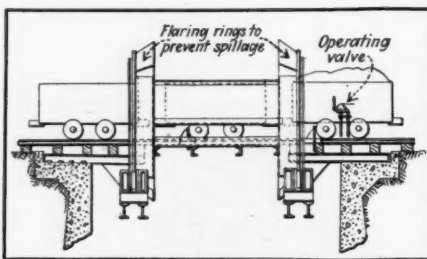
Chief among these is the saving effected in the height or headroom necessary.

A machine of this variety may be seen in the accompanying illustration.

### Improvements in Rotary Dump Save Spillage

Rotary car dumps possess many advantages over those of the ordinary crossover or kick-back varieties. In general these are well known to mining men and need no further comment here. In fact most mines nowadays, aiming to attain high capacity, use this type of dump.

As heretofore constructed dumps of this kind possess the drawback that



### Coal Cannot Spill

Improvements in this dump are embodied in two important details. The end rings and rollers are cast of an extremely hard metal which affords a perfect rolling surface. Furthermore, the end rings are flared inward greatly decreasing the spillage.

more or less coal has been spilled through the end rings; although this could be caught and guided into the coal hopper it was subject to decided degradation. The improved rotary car dump, shown in the accompanying illustration and manufactured by the Car Dumper Equipment Co., of Chicago, Ill., and Pittsburgh, Pa., is designed to overcome this difficulty.

In this improved dump the end rings are really frustums of hollow cones with flaring ends facing each other. This construction of end rings not only obviates spillage but makes a much more rigid cage or dumper frame. The end rings are cast from alloy steel which is so hard that it cannot be machined, and must be ground to shape. The treads of these end rings are, therefore, ground on a specially designed machine giving an extremely smooth running surface, harder than has been obtained heretofore upon any equipment of this kind. This not only

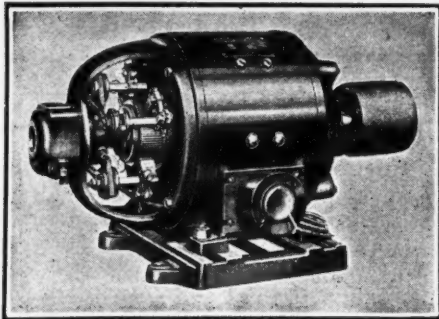
assures long wear but also reduces appreciably the power required to operate the dump. The supporting wheels are also made of the same alloy steel and ground to practically a perfect tread.

### Sturdy, All-Purpose Motor Can Handle Overloads

A new direct current motor, known as the type N.A. and intended to carry heavy overloads has been developed and placed on the market by the Louis Allis Co., of Milwaukee, Wis. This is a 40 deg., general purpose machine and coincides in essential dimensions, rating for rating, with the polyphase motors built by this manufacturer.

Improved design and ventilation insures uniform cooling throughout the windings and makes an unusually cool motor under operation. The bearing chamber is designed to hold an extra large quantity of oil, making frequent renewals or replenishments of lubricant unnecessary. The bearing inspection opening is closed by a removable cover. This, while permitting easy access, gives, in effect, a dust tight bearing chamber.

An entire elimination of oil trouble is claimed by virtue of the new design incorporated in the bearing. Difficulty experienced in the past, arising from oil soaked windings as the result of oil throwing, creepage, and the like, is made impossible in the present design.



**General View of Sturdy New Motor**

Details of construction have been given careful attention in the design of this machine. Note the staggered position of the brushes on the commutator. Oil slinging and creepage have been eliminated thus obviating all possibility of trouble from this source.

### Industrial Note

A. F. Case has been appointed manager of the coal and ore division of the **Welman-Seaver-Morgan Co.**, Cleveland, Ohio; **P. H. Douglas**, manager, general equipment division; **J. F. Rogers**, manager, gas producer division; **J. B. Shaub**, manager, engineering production; **J. H. Stratton** and **Miss J. L. Krotz**, assistant purchasing agents.

### Association Activities

The twelfth annual business session of the **Logan Coal Operators Association** was held Feb. 4 at the offices of the association in Logan County, West Virginia. Matters discussed and acted upon were not made public. New officers were not elected and the officers elected last year will continue their duties temporarily. These are: **M. E. Kent**, president; **C. W. Jones**, vice-president; **H. A. McCallister**, treasurer. **J. W. Colley** is the secretary of the association. Members of the executive committee are: **A. R. Beisel**, **J. H. Ford**, **C. H. Jenkins**, **H. E. Jones**, **A. J. King**, **J. A. Kelley**, **J. R. Thurmond**, **T. F. Downing** and **R. R. Smith**.